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GALL-BLADDER PROBLEMS*

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WHEN the surgeon opens the abdomen in a case which he has correctly diagnosed as one of gall-bladder disease he may find one of three conditions.

1. There may be an acute cholecystitis.
2. There may be a chronic cholecystitis.
3. The gall-bladder may show little if any deviation from the normal, apart from a few tell-tale adhesions, but when it is opened the surface is seen to be flecked with little yellow spots and streaks, which suggest so strongly the seeds of a strawberry that the name of "strawberry gall-bladder" has been given to the condition.

This yellow material has been shown by MacCarty,¹ to be of the nature of a lipid or fat-like substance. An investigation into the nature and character of this lipid has opened up a number of new lines of thought with regard to gall-bladder pathology. The methods employed were at first histological, but as the work advanced it was necessary to employ chemical and experimental methods, and finally aid had to be invoked from comparative anatomy.

In a paper of this length a full discussion of methods would be out of place. The ordinary fat stains such as Sudan iii, Scharlach R, and osmic acid were used. Lorrain Smith's Nile Blue sulphate method served to distinguish neutral fats from fatty acids. New micro-chemical methods were employed. Brief reference must, however, be made to one method to which sufficient attention has not been paid.

The low power binocular microscope or dissect-

ing microscope gives one an idea of the structure of the gall-bladder in health and disease such as is furnished by no microscopic section, however well it may be stained. When a normal gall bladder immersed in water is viewed under such a microscope a strangely beautiful picture is spread before one's eyes. One might be gazing into the depths of some marine pool in which exquisite sea-weeds were waving their delicate fronds. The anatomical text-books tell us that the mucosa of the gall-bladder is thrown into folds, but here we see rising up tall delicate membranes, thin as gossamer, covered by a delicate tracery of blood vessels, dividing the mucosa into a series of tiny court yards sunk like wells between the surrounding walls. Such a structure is seen nowhere else in the body, and it has a bearing on function the importance of which will be referred to in due course.

The finger of disease leaves its indelible mark upon this delicate structure as surely as the brilliance of a mirror is tarnished by the slightest breath. The gossamer walls become coarse and thickened, the little courtyards open into one another, and as sclerosis advances our marine pool seems to have dried up and all the wonderful flora withered away.

The picture presented by the strawberry gall-bladder is one of equal interest. The delicate folds are now thickened and opaque, and the peculiar yellow material stands out in startling contrast to its surroundings. It can be traced along the ridges, but never continuously, for the deposits are essentially discrete. It is most marked on the summit of the ridges, and is often confined to

*Read at meeting of the Canadian Medical Association Winnipeg, June 21, 1922.

that position, but in some cases it can be traced down the sides into the intervening depressions. We note at the same time that the pathological process is not really an advanced one. The folds still retain much of their original form, although coarsened and degraded. The end stages of the inflammatory process, the stage of destruction and scarring, is marked by a complete disappearance of the yellow deposits.

Turning now to the microscopic picture of the strawberry gall-bladder we find that the yellow material stains well with the usual fat stains; it appears red with Scharlach R and black with osmic acid. But the polarising microscope at once shows that we are not dealing with neutral fat, the glycerine ester of oleic acid. That substance, being isotropic, is invisible when viewed under crossed Nicol's prisms. But the lipid in the strawberry gall-bladder is anisotropic; it shines against the black background with a beautiful and silvery light. This phenomenon at once suggested that the substance was either cholesterol or some compound of cholesterol, for these bodies, as is well known, are doubly refractive in the highest degree. Our further efforts had as their object first to determine, with as great exactness as possible, the precise nature of the substance, and second, to ascertain, if that might be, the significance of these peculiar deposits.

Before pursuing this subject let us first consider the distribution of the lipid as seen in microscopic sections stained with Scharlach R. In ninety-eight gall-bladders examined, lipid was found microscopically in fifty-one. In only ten of these could the lipid be seen with the naked eye or with the aid of the dissecting microscope. The remaining cases were, therefore, not classed as strawberry gall-bladders. First and foremost it is found in the *epithelium* and particularly in that covering the villi. At times the lipid is seen as a thin red line running along the base of the epithelium internal to the nuclei, at other times it forms great masses here and there with intervening areas practically unaffected. In other cases the lipid is concentrated in the *stroma* of the villi. Here it may be either intracellular or extracellular. The cells which contain the lipid are mainly of the mononuclear series, but many elongated cells, which one takes to be fibroblasts, may also be filled with it. Sometimes there appears to be a regular trail of lipid which can be traced from the surface epithelium down through the stroma into the deeper fibrous layers.

Occasionally the lipid is found in the *fibrosa*. Here it is practically confined to the interior of fibroblasts and mononuclear cells. Moreover, it is found in the endothelium lining the small blood vessels, and, most amazing of all, actually within the lumen of the vessels. Whilst there is the danger that we may have misinterpreted the picture, and that the appearance is but an artefact, yet in a number of instances the lumen of the vessel was dilated at the spot occupied by the lipid globule, and the vessel walls appeared to curve around it.

To describe these appearances is easy, to explain them is another matter. In fact no explanation could be attempted until the exact nature of the lipid was accurately determined. Even without that knowledge, however, it was possible to formulate some ideas concerning the relation between the deposits and the presence of inflammation. It may be said at once that inflammation was present in every case. That inflammation was never acute. Nor was lipid found in very long-standing cases of chronic inflammation with extensive fibrosis. It was present in greatest amount in those cases which showed a mild inflammatory reaction in the mucosa, with even less evidence of trouble in the fibrous coat. Some congestion of the vessels, a varying amount of oedema, an infiltration of the loose stroma of the villi with lymphocytes and plasma cells but usually without the slightest desquamation of the delicate surface epithelium; surely these slight changes could hardly be expected to produce so remarkable a deposit.

Here we ask ourselves: is this really a deposit? May it not be that here we have merely the unmasking of an invisible lipid, rather than any real fresh deposits? A heart or a kidney the seat of profound fatty degeneration as evidenced by staining with Scharlach R may, when examined by quantitative chemical methods, be found to contain no more fat than the normal organ. What is normally hidden has become revealed, nothing more.

Before seeking an explanation let us see if an excursion into comparative anatomy will throw any light on the problem. The dog was the animal first chosen, and sections of the gall-bladder were stained in the routine way with Scharlach R. Naturally we did not expect to find any trace of lipid. Imagine one's astonishment when the surface epithelium was seen to be dyed a vivid red, owing to the presence of innumerable lipid globules which packed the cells.

Twelve dogs were examined in all, and in every one the appearance was the same. It was confined to the epithelial cells, and was never found in the stroma. No signs of inflammation were detected, and the presence of the lipoid was evidently a normal occurrence. The gall-bladder of the cat, the cow, the rabbit, the guinea pig, and the frog were examined. Only in the cat was lipoid found, and then only occasionally and in small amount.

This lipoid material in the normal gall-bladder of the dog, hitherto undescribed, appears to be quite different from the material of the strawberry gall-bladder in man. For one thing it is seldom brilliantly anisotropic. For another it does not react with the sulphuric acid test about to be described. In the dog, therefore, we find under normal conditions what appears to be a glycerine fat, whereas in the diseased gall-bladder of man we find deposits of what is probably a cholesterol fat.

Let us turn back for a moment and decide once and for all the nature of the material we are discussing. We have seen that the substance is a lipoid; it stains with the ordinary fat stains and is soluble in the ordinary fat solvents. Moreover it is doubly refractive under Nicol's prisms, so that the presumptive evidence is that it is related to cholesterol. It was felt, however, that if only one of the chemical tests for cholesterol could be applied to the tissues the matter would be placed on a much more certain footing.

Most of these tests are quite inadmissible in histological work. Many years ago, however, Moleschott showed that when concentrated sulphuric acid, diluted with one part of water to five of the acid, is added to cholesterol crystals, the latter take on a beautiful carmine red. This was the method we selected for tissue work. A frozen section of a strawberry gall-bladder was fixed on a slide and dried very thoroughly. The acid was then poured in a gentle stream over the section. After overcoming certain technical difficulties which need not detain us here, we had the pleasure of observing that the lipoid assumed first a yellow colour, and then a reddish brown or rather a henna. This was not the reaction for cholesterol, but could it be that for the ester of cholesterol? The ester was prepared, spread as a film on a slide, and treated with the acid. The result was a terracotta brown, practically identical with that seen in the gall bladder. The adrenal cortex, so rich in cholesterol ester, gave an identical reaction. Moreover the lipoid in the sections,

after treatment with the acid, became invisible under Nicol's prisms, and it was found that the ester, but not the cholesterol crystals, behaved in exactly the same way. We now felt certain that the substance we were dealing with was the ester of cholesterol with a fatty acid, and that in addition we were now in possession of a test which would demonstrate cholesterol ester in whatever tissue it might occur.

Two further observations may be cited in support of this view. First, the Maltese crosses which form so striking and beautiful a feature of the polariscopic picture of cholesterol ester were seen in a number of cases in the immediate vicinity of the lipoid masses. And second, when the lipoid was examined in frozen section, unstained, with the diaphragm almost closed it was frequently seen to be in the form of fine acicular crystals, these needles being even more distinct under the polarising microscope. According to Aschoff cholesterol in formalin-fixed tissues is found in this same acicular form.

Armed with assurance as to the substance with which we are dealing, let us now turn afresh to the question of whether the increase in the lipoid is real or only apparent. For this purpose chemical methods are necessary. A portion of the wall of the gall-bladder was taken, the mucosa removed under the dissecting microscope from the fibro-muscular coat, dried, weighed, the lipoid extracted, and the cholesterol estimated by the Bloor method. This was done with a normal gall-bladder and with a series of strawberry gall-bladders. It will be seen from the results contained in Table I that the increase of cholesterol

TABLE I
Showing varying cholesterol content of the gall-bladder in different conditions.

Type of Gall-Bladder	Per Cent Cholesterol by Weight
Normal Gall-Bladder.....	0.51
" " ".....	1.70
Inflamed " (No lipoid).....	0.36
Strawberry " No. 8-22.....	60.54
" " No. 160-22.....	46.40
" " No. 416-22.....	34.60
" " No. 624-22.....	50.45
" " No. 465-22.....	51.00
" " No. 839-22.....	41.80

in the strawberry cases was in many instances most remarkable. In one case there was 60 per cent. of cholesterol by weight compared with 0.5 per cent. in the normal, or 120 times as much. The increase was therefore real, and not merely apparent. Table II shows the findings in a peculiarly interesting case in which two-thirds of the gall-bladder showed advanced inflamm-

tory changes but with no lipid visible to the naked eye, whereas the remaining third, including the neck of the gall-bladder, presented a marked strawberry appearance, but comparatively slight inflammatory change. The latter contained two

TABLE II

Showing how the cholesterol content may vary in different parts of the same gall-bladder.

	<i>Mucosa</i> Per Cent.	<i>Fibrosa</i> Per Cent.
Part showing advanced inflammatory change.....	16.30	0.10
Part showing slight inflammation but marked strawberry appearance.....	41.80	0.17

and a half times as much cholesterol as the former. The theoretical interest of this case is great, for the part showing advanced inflammation must surely represent a late stage of the condition still prevailing in the strawberry portion, and yet what has happened to the lipid? A question at present unanswerable.

There is one last question: What is the cholesterol doing in the wall of the gall-bladder? How does it get there? Writers of great pith and moment have asserted that the gall-bladder mucosa produces cholesterol. While much of the cholesterol of the bile is produced by the liver, much, they say, is secreted by the gall-bladder, especially in conditions of catarrhal inflammation. Hence the increased concentration of cholesterol in gall-bladder bile as compared with liver bile.

With such a view one cannot for a moment agree. A consideration of the wonderful anatomical arrangement of the gall-bladder mucosa leaves one impressed with the conviction that the prime function of the organ must be absorption. The recent work of Rous and McMaster² has shown that a large amount of water is absorbed. My own opinion is that cholesterol is also absorbed. The evidence on which this opinion is based is not yet ready for presentation, but one or two observations may be given.

The first step was to determine whether solids in a state of solution could be absorbed. For this purpose the Prussian blue reaction was employed, just as was done by Weed in his investigation into the absorption of the cerebrospinal fluid. The gall-bladder of a dog was exposed, aspirated of bile, and an equal quantity of a 2 per cent. solution of iron ammonium citrate injected. Half an hour later the gall-bladder was removed, fixed, and treated with potassium ferrocyanide and hydrochloric acid. If the iron was

absorbed the granules of Prussian blue produced would be found within the wall. They were found there, both in the epithelial cells and in the stroma.

The final problem as to whether cholesterol itself is absorbed, and if so in what amount, has not yet been solved, for our investigations are not as yet completed. The following observation, however, is at least suggestive. The blood cholesterol of five rabbits was determined, and the average was found to be 25 milligrams per 100 cc. The rabbits were then given 0.1 gm. of cholesterol in a gelatin capsule every day. After four days the gall-bladder was removed from two of the animals. The feeding of cholesterol was continued. On the ninth day the blood cholesterol of all the rabbits was estimated. The results are given in Table III. It will be seen that

TABLE III

Illustrating the effect of cholesterol feeding and cholecystectomy on blood cholesterol in the rabbit.

Control (average).....	25 milligrams per 100 c.c.				
1. Fed cholesterol.....	38	"	"	"	"
2. " " ".....	30	"	"	"	"
3. " " ".....	32	"	"	"	"
4. Cholecystectomy.....	21	"	"	"	"
5. " " ".....	22	"	"	"	"

whereas in the control rabbits the average of the cholesterol had risen to 33 milligrams, in those in which the gall-bladder had been removed it had fallen to 21.5 milligrams.

The blood cholesterol is derived from a dual source. The first supply comes from the food and must be absorbed by the intestine. The second supply is the cholesterol in the bile which, as Dorcé³ and his associates have conclusively shown, is not lost to the body—it is too valuable for that—but is reabsorbed in some place hitherto undetermined. The result of the experiment just described would suggest that that place is no other than the gall-bladder and that it is this circulating cholesterol, the cholesterol taking part in what has been called the cholesterol cycle, which becomes deposited in the mucosa of the strawberry gall-bladder.

If this be true the observation is one of considerable importance. Not only does it throw light upon the behaviour of cholesterol in the body, and upon the function of the gall-bladder. It also suggests that, in some cases at least, gall-stones actually originate in the gall-bladder mucosa, and later become detached and grow because of additional deposits of cholesterol and

bile pigment. Some of our microscopic sections, indeed, show a great mass of cholesterol attached to the mucosa by the thinnest of stalks, ready to be detached by the merest touch. The relation of lipid deposits to the formation of gall stones must, however, be reserved for a future communication.

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PLEURISY AND TUBERCULOSIS

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ALTHOUGH pleurisy is a relatively common disease, our experience has shown that with the exception of empyema, we often fail to appreciate its true significance and as a consequence, treatment is inadequate and the end results disastrous. It is the purpose of this paper to emphasize the importance of the tubercle bacillus as a causal agent of dry and sero-fibrinous pleurisy and to direct attention to the special indications for treatment resulting from that etiology.

That the commonly occurring pleurisy with effusion, is caused by the tubercle bacillus in many cases is universally admitted. There is, however, a rather wide diversity of opinion as to the exact percentage of cases in which this organism is present. The finding of a tuberculous focus elsewhere in the body, especially in the lungs or in the mediastinal glands is, of course, accepted as evidence that the pleurisy is tuberculous and secondary. It is the so-called primary or idiopathic case which offers the difficulty. A search for the tubercle bacillus in the exudate is not often successful. Even when large amounts are digested and concentrated by centrifuge the bacillus is not found in more than 20% of cases. By animal inoculation a higher percentage is revealed, and when large amounts, 15 c.c., or more are injected and the injections repeated, positive results as high as 85% have been obtained. The preponderance of lymphocytes in the fluid is of some significance but the cytology varies greatly with the acuteness of onset and symptoms, with the time elapsing from formation to withdrawal and even with the point of the puncture, since cells will gravitate to the lowest point,

so that too much stress should not be placed upon excess of any particular type of cells. A marked eosinophilia may be taken as in a majority of cases ruling out tubercle. An insidious onset, an effusion reaching a large size before the occurrence of symptoms and a tendency to recur are all very strongly in favour of a tuberculous origin. A careful history of previous health will often reveal a period of ill-health which frequently can be shown to have been due to tuberculosis; the after history is of great importance, not only that of the weeks immediately following the illness, but that of several years subsequently.

Insurance statistics establish a mortality from tuberculosis among the insured giving a history of pleurisy within five years preceding insurance, which is three times the mortality of insured individuals having no history of pleurisy. Of eleven ex-soldiers in whom no primary tuberculous focus could be found during the several months hospitalization following pleural effusion occurring during 1918 and 1919, nine have since been re-admitted for treatment with definite signs of pulmonary involvement, leaving only two who after four years or less are presumably free from tuberculosis. The percentage of primary or idiopathic pleurisy with effusion that has been definitely proved tuberculous, in the series of various authors, varies from a minimum of 22 to a maximum of 85%. Fishberg believes that 40% subsequently become tuberculous and that all these will develop within five years. Norris and Landis, Lord, Osler and MacCrae state that the percentage is more than fifty, while West states that certainly 50% and probably 75% are definitely tuberculous and the four author-

ities would treat every case as tuberculous until proven otherwise and would continue treatment for a sufficient period of time to insure arrest of disease. It is evident that the only safe course in dealing with sero-fibrinous pleurisy even if no tuberculous focus in lungs, glands or other organs can be found, is to bear in mind its probable tuberculous origin and treat accordingly, not only during the acute period but for months subsequently.

Mention should be made of the pleural effusion due to pneumococcus, occurring without the usual pneumonic consolidation and most often met with as a primary effusion or empyema in childhood. If not frankly purulent, this effusion is turbid, runs an acute course and its non-tuberculous nature is proven by the cultivation of the pneumococcus.

Two series of experiments seem to strongly corroborate the evidence as to the role of a previous infection in the production of effusion either purulent or serous. Floyd concluded from his series of experimental infection of the pleura with pyogenic organisms that only when previously sensitized for a few days, *i. e.*, by previous infection, does empyema follow the introduction of pyogenic cocci into the pleural sac. Patterson, working with tubercle bacilli, showed that only in allergic animals, *i. e.*, previously tuberculous animals, does effusion follow introduction of living tubercle bacilli into the pleural cavity. These two series of experiments offer the only rational explanation of the variable response of the pleura to trauma, whether it be external injury or penetrating wound of the chest, the latter of which has been so frequently encountered in ex-service men. Many of those with bullet or shrapnel wounds of the chest made rapid and apparently complete recovery without effusion or empyema. Some developed empyema, and according to Floyd's experiments were already sensitized, presumably by infection of the sub-pleural lung tissue and the pleura itself. Others developed serous effusion which remained serous, and these according to Patterson's studies, were already allergic to tubercle bacilli by reason of previous infection, sufficiently recent not to have become obsolete.

The most typical dry pleurisy is that encountered with lobar pneumonia and which is, of course, secondary to the pneumonic process in the lung and caused by the pneumococcus. This is fibrinous pleurisy, involving a large area of pleura, usually basal and accompanied by

sharp pain or stitch and evidenced by the typical to and fro friction rub. There are many cases of dry pleurisy which do not accompany pneumonia and are usually called idiopathic. These may be severe or mild, acute or chronic, may involve a large area, but more often are confined to a smaller area, in the axilla, the pectoral, the parasternal or the scapular region or to an apex or the diaphragm. Leaving signs and symptoms for later consideration, let us inquire into the etiology of these so-called idiopathic cases.

This has been assigned to a variety of causes, trauma, exposure to cold, rheumatism, gout, specific fevers as typhoid and most frequently to extension from adjacent parts, such as chest wall, lung, pericardium, mediastinum, diaphragm or spine. The last two groups have a primary focus which is obvious in the majority of cases and may or may not be tuberculous. The only evidence of a gouty origin of pleurisy is the finding of gouty deposits in the pleura at autopsy. Rheumatic fever must be an extremely rare primary cause, pleurisy being found in only 4% of a large series of cases of rheumatic fever and then it was dry, of short duration and ran a simple course. If we bear in mind the frequency with which extensive rib fracture occurs without pleurisy following, trauma will not be a satisfactory explanation unless injury of lung or severe damage of chest wall is demonstrated. With the modern knowledge of the rôle of bacteria, exposure to cold may be disregarded except as favouring the development of organisms through lowered resistance.

Practically all authors are convinced that dry pleurisy, when occurring in the absence of disease in adjacent tissue or of specific fevers such as typhoid, is to be considered due to tubercle bacillus and to the same extent as pleurisy with effusion. Syphilis may be a possible cause, but at present accurate statistics are lacking, since only in recent years has it been possible to demonstrate the spirochaete.

From autopsies and from the subsequent histories, it is established that the great majority of "idiopathic" dry pleurisies are due to the tubercle bacillus. The percentage is believed to be the same as that of pleural effusion, at least 50% and most probably 75 or 85%, and again we emphasize the importance of directing treatment in accordance with the probable tuberculous nature of the disease.

The signs and symptoms of pleurisy with effusion are known to every physician. Its diagnosis is seldom difficult and can usually be established

by the exploring needle. The typical dry pleurisy with well marked friction is even less obscure. But dry pleurisy is often remarkable for the absence of recognizable physical signs and the mildness of its symptoms. A localized area in any part of the chest, even the axilla, may fail to show appreciable change to percussion; friction rub is more frequently absent than present; at most only a few rales indistinguishable from intrapulmonary sounds or muscle or joint sounds are found on auscultation, and breath and voice sounds remain normal. While the pain may be severe, it will more often be only an ache, or felt only after exertion, coughing or deep breathing, or towards the end of a tiresome day. Its recognition will depend on its persistence, its tendency to recur and on a close observation of the general health of the patient.

Dry pleurisy of an apex may at times be recognized by a friction rub or by a superficial crackle on deep inspiration. Often signs are lacking, especially if adhesions have formed. It seldom produces acute pain, but usually a dull ache of the shoulder or beneath the scapula. It may be recognized from inequality of the pupils, sweating of half the face, flushing of one cheek, all resulting from sympathetic involvement. The presence of an enlarged gland at the inner end of the clavicle under the sternomastoid, is, according to Fishberg, pathognomonic of tuberculous pleurisy. Apical pleurisy may represent abortive tuberculosis leaving only an adherent apex or it may persist or recur and in the latter case, a pulmonary lesion sooner or later is evolved. Often it is really secondary to an underlying lung lesion, which we may or may not be able to discover on examination. The x-ray may establish the diagnosis when lung parenchyma is involved, but in pleural involvement only, it may merely show a veiled or ground glass appearance of the apex which is not of itself diagnostic, being frequently found in apparent health. The presence of either signs or symptoms of apical pleurisy, no matter how slight, should lead one to search for constitutional symptoms, slight fever, rapid pulse, loss of weight, fatigue, digestive disturbance, persistent dry cough, and the other symptoms of early tuberculosis.

The differential diagnosis of dry pleurisy, either acute or chronic, is often difficult and especially if physical signs are not in evidence. It had to be differentiated from rheumatism of shoulders or intercostal muscles, from muscular strain due to cough, pleurodynia, intercostal neuralgia,

herpes zoster and disease of chest wall or spine. Regarding rheumatism, we have already seen that only 4 per cent. of cases of rheumatic fever have pleurisy which is always benign and of short duration. Chronic rheumatism belongs to the ages of forty and after, while the years from twenty to forty are those of greatest tuberculous incidence. Fishberg says, "Pain in shoulder which may become severe and intractable is not to be pronounced 'rheumatic,' but a search made for apical or diaphragmatic pleurisy." In the absence of rheumatism elsewhere in the body or history of its recent presence, a diagnosis of rheumatism is unjustified and most certainly should not be made until dry pleurisy and tuberculosis are excluded.

Intercostal neuralgia is characterized by neuralgic (jumping) pain, rather than a stitch or ache; there are tender points where branches reach the superficial tissues. Neuralgia presupposes the existence of an exciting cause, such as a lesion of the spine. Lord says, "A diagnosis of intercostal neuralgia or pleurodynia amounts to a confession of ignorance." The appearance of the local lesion is sufficient for differential diagnosis in herpes zoster which may follow true intercostal neuralgia, and in lesions of the chest wall and spine. The frequency of dry pleurisy as shown by autopsy is such that the probable diagnosis is always pleurisy, unless one of the other conditions can be established beyond question.

The treatment required during an attack of pleurisy, either dry or sero-fibrinous, is exceedingly simple, consisting of rest in bed until fever and pain subside, the administration of laxatives, analgesics and dieting in accordance with the symptoms of the individual case. The application of heat or cold, mild counter irritation with iodine or strapping may be useful in controlling pain. Excepting thoracentesis which may be urgently indicated in certain cases, there is no specific treatment of pleurisy. In fact serious and well-founded objections can be presented to practically every other procedure or mode of treatment which is advocated and the numbers and variety of such treatments are, to say the least, bewildering. We need not discuss these here.

With thoracentesis, should be combined replacement of effusion by oxygen, nitrogen or air, the co-called pneumoserosa of French literature. This latter treatment is also advocated by some in dry pleurisy, in which separation of the in-

flamed surfaces affords instant relief of pain, favors early subsidence of the inflammation and tends to prevent adhesions and further effusion. Pleural effusions reaching to or beyond the spine of the scapula should be aspirated at once, although some authorities would wait for a day or two in the hope of spontaneous absorption beginning, provided the patient's condition remained satisfactory. The occurrence of severe dyspnoea, cyanosis, cardiac distress or signs of oedema in the opposite lung are absolute indications for immediate thoracentesis, regardless of the size of effusion. Bilateral effusion is also to be considered a positive indication for tapping. In all other cases of pleural effusion, thoracentesis is not positively or urgently indicated, and its employment is largely one of personal choice. The writer favours non-interference for two or three weeks in the average case, in the hope of spontaneous absorption beginning. If after that time no evidence of beginning absorption can be found, or if the effusion is increasing, withdrawal of fluid is advised.

Before aspiration of fluid is undertaken, whether in urgent cases or because regarded as desirable for general reasons, it is of the utmost importance that the etiology of the effusion be first decided. Unless definitely able to exclude it, the tubercle bacillus is to be considered the offending organism and it is extremely important to determine the presence or absence of a tuberculous lesion in the lung of the diseased side. If there is tuberculous involvement of the lung or if there is evidence of active tuberculosis as indicated by symptoms or history, modern practice demands that fluid be replaced by air, oxygen or nitrogen. Failure to do this almost invariably results in adhesions which render subsequent treatment by artificial pneumothorax impossible, should it become necessary or desirable. It has been our experience that pneumothorax all too frequently offers the only chance for life that we can offer to many of the 85 per cent. who subsequently become or were already tuberculous. Failure to recognize the tuberculous nature of pleural effusion and failure to search out the tuberculous lesion in the lung or the tubercle bacillus in the sputum means disaster sooner or later to many a patient who is treated regardless of this condition.

In the patient in whom no primary focus or history of previously active tuberculosis is found, the case must be carefully observed during several weeks succeeding the pleurisy to determine the

presence or absence of such signs or symptoms as would establish the diagnosis of tuberculosis. Among them slight fever, rapid pulse, loss of appetite persisting after the acute period, continued loss of weight, slow and incomplete convalescence, persistence of slight cough are all of tremendous import. In these cases also, gas replacement is the correct procedure until diagnosis and prognosis are definitely determined.

Gas replacement of pleural effusion has many advantages to commend it: (1) All fluid can be withdrawn at one sitting; (2) It is followed by rapid healing in most cases, and the exudate seldom returns; (3) Formation of adhesions or extensions of existing ones is prevented; (4) Pain is relieved instantly and completely; (5) Shrinkage of thorax is counteracted; (6) Danger of rapid decompression is minimized or averted; (7) Danger of laceration of lung is lessened; (8) Concomitant tuberculosis can be treated and treatment continued; (9) It assists in diagnosis and prognosis, affording time for their more exact determination. Of vastly more importance to the patient, than the treatment during the attack, is the after care. "The physician's responsibility does not end with the disappearance of acute symptoms, no matter how mild or how reassuring the general condition, permanent results require supervision at regular intervals for a long time."

Every case should be warned of the possibility and probability of tuberculosis, and should be treated in accordance with present day standards for the treatment of tuberculosis. It may be necessary to change from an unfavorable occupation, to seek more hygienic living quarters, to avoid strenuous labor or sports; many may be allowed to continue their usual employment under frequent medical supervision. If a lesion of the lung is recognized or if symptoms of active tuberculosis are present, then the hygienic treatment of tuberculosis, either at home or at a sanatorium, is imperative, and such supervision as may be required should be continued over a sufficient period of time.

SUMMARY

(1) Dry or sero-fibrinous pleurisy, acute or chronic, is to be considered tuberculous and treated as such, unless tuberculosis can be absolutely excluded.

(2) A diagnosis of intercostal neuralgia, rheumatism or pleurodynia is only to be made when

adequate cause can be shown. Pain of any degree about the chest should arouse suspicions of tuberculous pleurisy.

(3) Favorable end results in the treatment of pleurisy can only follow the recognition of the place of the tubercle bacillus in its etiology.

(4) Thoracentesis is not necessary in every case of pleural effusion, but whenever aspiration of fluid is undertaken, air should replace the fluid

withdrawn unless tuberculosis has been positively excluded.

(5) Aside from its use in artificial pneumothorax, the introduction of air into the pleural sac is the most satisfactory known treatment of pleural effusion, no matter what its etiology.

(6) An essential treatment of tuberculous pleurisy is after care of the patient for months and years.

THE USE OF CIRCULATORY STIMULANTS IN THE CARE OF THE SICK*

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WHAT is a stimulant? Definitions are notably difficult and unsatisfactory, but that given of a stimulant, in the *NewEnglish Dictionary* appears to me to be the best; viz., something that temporarily quickens some vital process, or the function of some organ. That in *Nelson's Encyclopædia* is also good—medicinal agents which increase the functional activity of a living organ, and which, at least in some cases, induce slightly increased irritability of living tissues.

Stimulants, of course, are not always drugs. Food, heat, various reflex impulses, all increase function, as do also emotions, as joy and hope, but to this last aspect of the subject we will return.

The object of a good circulation is the keeping up of a sufficient arterial pressure for the carrying on of the functions in the various organs. Anything which will improve the arterial blood pressure when this tends to fail is a circulatory stimulant. Stimulants differ from tonics in that their action is more speedy and transitory, but they are usually considered together in medicine and we will do so here.

The ways in which stimulants increase function are very complicated and differ in different instances. As Meyer and Gottlieb put it¹ "Increased discharge of energy—that is to say increased functional activity, or stimulation—

results alike from the removal of inhibiting forces or the introduction of accelerating ones."

A horse can be made to go better by increasing its food supply, by loosening the reins, or by the use of the whip or other urging influence. The food increases chemical changes in the tissues, the loosening of the reins lessens inhibition, while the whip is an external stimulant. In the same way, the heart can be caused to do more and better work by improved nutrition, by lessening the influence of the vagus, or by stimulating the sympathetic—the whip of the heart. Sugar and alcohol will specially act in the first way, atropine and to a lesser extent alcohol in the second, while the sympathetic can be stimulated directly by adrenalin and tyramin or reflexly by swallowing strong alcohol or ammonia, and the muscle directly affected by digitalis and caffeine and probably the diffusible stimulants as ammonia and ether.

The measurement of the effects of stimulants in a given case is often a difficult matter, and one must frequently be guided by the general improvement in the patient and his increased *bien etre* rather than by any very definite signs. For instance, the blood pressure is a poor guide. Thus, atropine immensely increases the action of the heart and yet rather tends to lower the arterial pressure. Digitalis slowly strengthens the heart but seldom raises the blood pressure unless this be already low because of a failing heart.

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The rate of the heart, again, is an uncertain indication. Atropine increases it and digitalis lessens it and yet both increase the work done by the organ. Often the pulse rate and the blood pressure will remain unaltered and yet the patient feels and is better. I recall a case of complete heart block who was having frequent attacks of the Stokes-Adams' syndrome but as long as he took digitalis he remained free from these, and yet we could detect no alteration in the rate of either auricles or ventricles and the blood pressure remained unchanged. Phair and Parkinson² recently record a similar case where a similar result was obtained from the use of adrenalin although no change in the heart block occurred and the ventricular rate remained unchanged.

The stethoscope, the sphygmograph and the electro-cardiograph are valuable instruments but many of the circulatory changes are far too delicate to be appreciated by them. The skilled eye of the physician can often recognize slight changes for good or for evil in his patient's state which cannot be shown instrumentally.

The *New Standard Dictionary* gives emotions, such as joy and hope, as stimulants, and it behooves us always to remember this. A cheerful environment, a hopeful prognosis, will often improve the circulation more than most of our drugs. "What doctor possesses such curative resources as are latent in a spark of happiness or a single ray of hope?" queried that neurotic but charming French writer, Amiel. Pope wrote beautifully of hope springing eternally in the human breast, but we doctors know that sometimes it burns very low and yet can by a cheerful environment be fanned into flame again, and with it comes improvement. Often we must be present at a bedside where there seems little to look forward to, but fortunately, nature generally throws a cloud over the sufferer's senses and he does not look far ahead, and if we can encourage the hope of say a better night or the near lessening of the distress we may do good, and leave the further future to take care of itself. Sometimes we do well even to encourage a bastard hope, to quote from the *Merchant of Venice*.

As long as the circulatory apparatus is acting normally, stimulants are unnecessary and, indeed, have very little effect if given. The heart here can sometimes be slowed by digitalis and can always be quickened by atropine but these changes produce no improvement in the individual because no improvement is possible where already conditions are good. It is otherwise when the

circulation is not normal. In other words, the clinical effects of drugs are very different from the pharmacological ones. For example, if the temperature be normal few drugs will lower it, but when raised it is easily so affected. When the heart is beating very fast, as in many cases of auricular fibrillation, digitalis very promptly slows it yet this drug has very little slowing effect when the rate is normal. Many drugs only act as diuretics when there is cedema present, and so on. Pharmacological experiments with drugs are chiefly done upon more or less normal organs and tissues, and that usually of the lower animals, and it is a long step from these to the reactions in diseased human beings. A drug may have an effect pharmacologically, which is not present when it is given in disease, and, on the other hand, it may have no effect pharmacologically when it is active in disease. It is very difficult to demonstrate any action of expectorants in normal animals or, indeed, in healthy human beings, but when given in a case of acute dry bronchitis we soon see how well these act and bring relief. "As a matter of fact", to quote from Meyer and Gottlieb³, "it is the outspoken or quietly cherished opinion of many physicians that the effects of drugs in human patients can in no way be reconciled with those observed in animal experiments, and that the latter are, generally speaking, of no value for practical therapeutics, in which experience at the bedside should be the sole guide of the physician." This is true to a certain extent, but, to take an illustration from another department, where would modern agriculture be without scientific and often laboratory investigation? The truth is, both bedside work and laboratory investigation are equally necessary and should go hand in hand. They are in no way rivals, but constitute a team and both are required if we hope for advance. The best therapist is he who, having a good knowledge of what is doing in pharmacology, cautiously incorporates in his work the results that are there obtained.

It is needless to say that when an individual shows signs of a failing circulation he must be kept at rest. This is only comparative rest, for we can never completely rest the circulation, but it may of itself be sufficient, and much of the good results often attributed to drug therapy is really due to it. A patient comes to his doctor showing signs of cardiac failure. He is given a bottle of medicine, probably containing digitalis, and is told to stay in bed. In a few days he is much

better and both he and his medical attendant sometimes ascribe all the improvement to the medicine, when most of it was due to the rest. But all patients do not improve from rest alone and then stimulants have their place. I do not for a moment mean that in a case of failing heart we should rely upon rest and only use stimulants when this fails. They must both be employed only we should always remember in interpreting the results that two factors have been at work.

A failing circulation shows itself in various ways and the treatment must vary accordingly. In one instance the symptoms are dizziness and even syncope and are due to underfilling of the arteries. In another there is cyanosis, with venous engorgement of all the organs, and the arterial pressure may be normal or even raised. Again, there may be œdema, with or without cyanosis. In all there is dyspnoea on exertion or even while at rest.

In syncopal cases the diffusible stimulants are specially indicated. These are chiefly alcohol, ether, and ammonia.

Alcohol. Few drugs have been so much written about as alcohol, and battles have been waged on the question of whether or not it is a stimulant or a depressant. To my mind such discussions are academic and beside the mark. When experts differ the man in the street is often the best judge, and in his mind there is no doubt about the value of alcohol as a stimulant, and the accumulated experience of mankind is that when anyone is in a state of depression or collapse it is well to give him a drink containing alcohol. The man in the street does not know or care how the drug acts, but he does know that it tends to improve such an individual's condition. The normal person needs no alcohol although he may desire it as a beverage, but when he is ill it often helps him. The effects of alcohol on the circulation are very complicated but the following are pretty well recognised. When taken in concentrated form by the mouth it reflexly stimulates the heart through the sympathetic nerves, and also reflexly increases vasomotor tone, and hence slightly raises the blood pressure. When administered well diluted these effects do not occur. After absorption alcohol slightly depresses the vagus and hence the heart tends to go a little faster, but it also acts as a food to the heart muscle (alcohol having a caloric value of about seven calories to the cubic centimetre) and this latter effect is of great value when the nutrition is low, as in prolonged fevers, for alcohol requires no digestion but is directly absorbed and then

burnt up. The result is that in weakened conditions, such as typhoid fever, the heart may be so improved that it beats more slowly but with greater force. In such cases it indeed maketh glad the heart of man. I think that Lauder Brunton's directions for the use of alcohol in disease were excellent. He wrote:⁴ "The rule for the administration of alcohol is a very simple one. It is to sit by the side of your patient for a while and watch him after the administration of a dose of alcohol, and if you find that the alcohol brings back the various functions nearer to the normal then it is doing good; if the functions diverge further from the normal after the administration of alcohol then it is doing harm. I use this means of expressing the action of alcohol advisedly, because if we take the different functions we find that a special rule will not include them all. Thus, the pulse may become quicker or slower after the action of alcohol, and yet the question of whether good or harm has been done depends upon the condition of the pulse beforehand; that is to say, if the pulse has been abnormally slow, and it is quickened by alcohol, it is doing good, for it has brought the pulse nearer to the normal. On the other hand, if the pulse has been abnormally quick, and is slowed by alcohol, it again has been brought nearer to the normal, and hence the alcohol in this case has done good. . . . The same rule is applicable to the tongue. If the tongue was previously dry and becomes moist after alcohol, then it has done good; in the same way, if the skin were too hot and dry before we gave alcohol, and the alcohol brings it back more to the normal, makes it cooler and moister, then the alcohol is doing good. If, on the contrary, the alcohol makes the skin drier and hotter in fever, then it is doing harm. But if the skin were cold and bedewed with sweat in collapse, and alcohol makes it warmer and drier, it is again doing good."

One might paraphrase these sound views by saying that in depressed conditions the drug should be cautiously tried, always watching the effects closely, and if the patient improve then continue it for a time, but if he does not do so stop it.

Ether is often of use in cases of failing circulation. Pharmacologically its effects are slight, but in conditions of collapse the stimulating influence is undoubted. Martindale and Westcott say, "It saves many lives threatened with syncope, collapse, and shock from hæmorrhage or injury." For these purposes it is best given hypodermically,

a syringe full at a time but in milder cases it may be given by the mouth as Hoffman's anodyne. Ether is an intoxicant and when Father Matthew put down the use of alcoholic liquors in a large part of Ireland many people took to ether instead.

Ammonia when inhaled or taken by the mouth acts reflexly and hence the common use of smelling salts and of sal volatile in syncope. The drug is much used in the tropics in cases of snake bite, largely replacing alcohol for this condition. When ammonia is given hypodermically or intravenously it raises the blood pressure and directly stimulates the heart muscle, and, as Cushny says, "may be sufficient to tide a patient over an acute collapse."

Strychnine is perhaps at present the most commonly used stimulant in cases of collapse. There is no doubt about its value as a general tonic, but in emergencies it is disappointing and has little effect upon the heart rate or blood pressure. I think, all the same, that Sir James Mackenzie was a little too sweeping when he wrote that "there is not a single observation, clinical or experimental, of the slightest value to show that strychnine in medicinal cases has any effect upon the heart or blood vessels."

Caffeine has been overestimated as a circulatory stimulant. It has a slight action upon the heart, at first slowing it through the vagus and later hastening it through direct action upon the muscle. The strength of the systole is thus slightly increased, but the blood pressure is little affected as there is a vaso-dilatation which counteracts the effect of the increased heart action. The chief action of caffeine is on the central nervous system, and in cases of dropsy on the kidneys. In the latter instance it is often extremely useful in enhancing the diuretic action of digitalis.

Adrenalin and *Pituitrin* both raise the arterial blood pressure and are of use in emergencies when this is seriously low. As is well known, they bring about this effect in quite different ways, the pituitrin acting directly upon the muscular coat of the vessels while the adrenalin exerts its effects through the myoneural junctions of the sympathetic. I prefer pituitrin and have often found it of great use in pneumonia when the blood pressure is very low. Pituitrin has little direct effect upon the heart, adrenalin has a complicated one owing to two factors. At first it hastens it by stimulating the sympathetic, next slows it through the rise in arterial blood pressure, and finally hastens it again as the vagus

tires and the sympathetic action once more predominates. Both of these drugs only act very slightly when given hypodermically, more when used intramuscularly, and very actively when given intravenously.

Camphor is a drug which has very little effect upon the normal circulation, but there is much clinical evidence that in infective conditions, such as pneumonia, its action is more evident. Given intramuscularly or even intravenously in olive oil it is greatly used in this condition, especially in Germany.

Atropine acts purely by releasing the heart from vagal control, so that it beats more rapidly. Vaso-dilation also occurs so that the blood pressure tends to fall in spite of the hastened heart. It is a powerful stimulant of the respiratory centre which action is often useful when the circulation tends to fail. Its special indication is in heart failure with oedema of the lungs, where it will sometimes temporarily save life.

So far we have been considering the stimulants of use in emergencies, the diffusible ones being the quickest and best in sudden cases and the others when the circulation tends to fail in infections, such as pneumonia and typhoid fever. Many would put digitalis in the latter group and there is some evidence that it is of value in pneumonia, but it is not of a very strong kind, and personally I do not think that digitalis would be much missed if it were never used in acute conditions. But when the heart tends to fail in chronic conditions it is to the digitalis group of drugs, and especially to digitalis itself, that we can turn with great confidence. Much has been written as to the proper kind of case for the use of digitalis, but I think that one can summarize the matter in a single paragraph.—The drug is indicated in all afebrile cases of heart failure accompanied by oedema, and here it seldom fails to give relief; in cases where there is cyanosis without oedema it is of some value; in fast regular hearts without evidence of heart failure it is of little use.

Of recent years, chiefly due to the Mackenzie school, it has been taught that digitalis was specially indicated in auricular fibrillation, and, indeed, many have gone so far as to say that it was only here that it was of any great value. But much evidence has lately been accumulating that it also acts well when the heart is regular. The fact is that about 70% of the heart cases that come to hospital with symptoms of failure have auricular fibrillation, but it is not the fibrillation

that calls for digitalis but the ventricular failure. A fibrillating heart may not need digitalis if the ventricles are acting well in spite of the handicap, and, on the other hand, a heart with normal rhythm may require the drug very much. Digitalis has no effect upon the fibrillating auricles, in fact, it will sometimes produce fibrillation if given freely enough. In a paper given at the meeting of the Association of American Physicians last May, Dr. Christian, of Harvard, pointed out that, taking the three criteria of benefit from digitalis as being loss of weight from the lessening oedema, diuresis, and slowing of the heart, cases with normal rhythm did just as well as those showing fibrillation; and in the discussion that followed, Dr. H. A. Hare went so far as to say that he thought that the drug was more useful in failing compensation where the rhythm was regular than where fibrillation existed. I would not go to this length but would like to urge that digitalis should be used in all cases of heart failure, especially those showing oedema, whether the rhythm be regular or irregular and whatever the lesion.

When digitalis fails to produce its expected results—of lowering in weight, diuresis and slowing of the heart rate—the explanation is generally one of the following: (1) the wrong kind of case; (2) defective quality of the drug used; (3) insufficient dosage.

As already said, digitalis is of little use in acute conditions or in fast regular hearts without oedema. When oedema is due to kidney involvement or other extracardiac cause the drug will have little effect.

The quality of digitalis varies greatly, some samples being of full or even excessive strength while others are nearly inert. This has been pointed out in recent years by many workers. Only the other day Moffat and Lewis, of Montreal⁵ found that of many samples of tincture tested on cats 78% were below strength, and the infusions were even worse. Hence, the importance of only using digitalis from reliable firms.

As regards the dosage, even when we know that the drug is good, the amount suggested in the pharmacopœias is usually insufficient. The dose of the tincture given in the *British Pharmacopœia* is 5-15 mins, in the *American* 7½ mins. and in the *German* as maximum 1.5 grammes. Nowadays in an average case the usual amount

given is from one to two drachms in the twenty-four hours. Or, we can employ what is called the massive method, where the total quantity probably required is given in one day. This is .15 c.c. for each pound of the body weight, so that a patient weighing 150 lb gets about 22.5 c.c. in twenty-four hours, or about 5½ drs. This massive method is still on its trial and seems to work well in hospital where the patient is under constant observation, but as a rule the more gradual way is advisable and the results are just as good although they take longer to appear. Some patients need much more of the drug than others before they show the effects, and the rule should be to give say 20 to 30 mins. three times daily until the heart rate is reduced to about 70 per minute or until any untoward effects appear. These are chiefly gastric disturbance, scanty urine replacing the diuresis or coupled heart beats. As long as none of the unwished-for effects occur the drug can be continued even although we have already far exceeded what many can take. Idiosyncrasy in regard to digitalis is very great.

Time will not permit of any discussion of the many different preparations of digitalis, but the effects can usually be equally obtained from the tincture, the infusion or the powdered leaf.

In urgent cases of failure strophanthin is valuable and may be given intramuscularly or even intravenously. The dose is generally given as 1/100 gr. but the drug is a very edged tool and I would advise the use of not more than half this amount, which, if necessary, may be repeated in a few hours.

Such are a few disjointed thoughts on the use of stimulants in the treatment of the sick. Often they fail us because the muscular tissues of the circulatory apparatus are too much damaged to respond to the call, but in most instances we can lessen distress by improving the blood flow, and in some cases may even make the difference between life and death.

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FUNCTIONAL PARAPLEGIA (WITH CASE REPORT)

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AS a representative of that large and interesting group of nervous disorders which we regard as functional in nature, Paraplegia has more than an ordinary claim on our attention. In the first place it is one of the easiest neuroses to cure and lends itself particularly well to the elucidation of the principles on which psychotherapy is based. In the second place it is not always recognized as such and cases have passed through the hands of eminent physicians who have either failed to recognize its nature or if they have recognized it, have failed to bring about a cure.

In the spring of 1918 I arrived at the Seale Hayne Neurological War Hospital on the same day as a patient who had not walked for three years. He was a bright, intelligent man of thirty years, well nourished and healthy in appearance. For eighteen months he had been a patient in various military hospitals in England. It is hardly probable that this patient could have remained this long in hospital without having the skilled advice of some eminent British clinicians. I do not know whether they recognized the functional nature of the case or not, but I do know that they failed to cure him and that he was discharged to pensions with 100% disability. Eighteen months later, that is three years from date of origin, he was taken from his home to Seale Hayne and a few days later I saw him running around the square like a school-boy. His cure had been effected by psychotherapeutic measures.

A few days later I saw another patient who was brought to hospital on a stretcher. Two years previously he had a fracture dislocation of the vertebrae. This was followed by a laminectomy which left a depression in his back large enough to hold a small saucer. He had not made any attempt to walk since the accident. As there was definite evidence of organic damage to the cord, such as the presence of Babinski's reflex and ankle clonus, there was a good excuse for looking upon this case as an organic and permanent paraplegia. The neurologists at Seale Hayne, however, assumed that there might be a functional element

in the case, and their efforts were rewarded a few days later by seeing the man walk several miles with the aid of a walking stick.

This was a case in which a minor part of the disability was organic and permanent, but in which the major part was functional and curable. I cite these cases to show you that it is not only the busy general practitioner who may fail to recognize and cure such cases, but that the same thing happens to men of wider and more mature experience.

In the third place functional paraplegia has played such an important rôle in the history of quackery that this phase of the subject has more than ordinary interest. There is hardly an irregular sect or system of cure which has not received an undeserved amount of credit because they have made a paraplegic walk. Two years ago a girl who had not walked for four years made the pilgrimage to St. Anne de Beaupre and there threw away her crutches. A miracle was announced. The records of religious shrines have in all ages supplied evidence of cures of similar nature. St. Anne de Beaupre and Lourdes have scores of cases to their credit. Similar cases fall into the hands of chiropractors, osteopaths, Christian scientists and other less widely known healing cults. A marvellous cure is heralded far and wide, and becomes an effective advertisement for the particular treatment; another failure is credited to the medical profession and thousands of people are persuaded to seek help at these false fountains of healing. Many of them are relieved of their money if not of their malady, and so the game has been going on since the beginning of history.

I might also cite the case recorded in the fifth chapter of St. John of the cripple who, being a paraplegic for thirty years, was commanded to take up his bed and walk. He did so and it states distinctly that his cure was the result of his great faith. It is not too much to say that this was a case of functional paraplegia, but I am not unmindful that I am on dangerous ground when I attempt to remove this case from the realm of the miraculous. I can defend my

position, however, by saying that the laws of nature would never be broken by Divine intervention if the desired effect could be produced by the operation of natural law.

Having made a feeble attempt to emphasize the importance of my subject, I make no apology for reporting a case which I was fortunate enough to meet, treat and cure in 1919. I realize that there is nothing remarkable in this case from the point of view of the neurologist. However, it may serve to focus attention on certain principles of therapy which are not as widely appreciated as they should be.

The case referred to is a lady, now forty years of age. She was thirty-eight years old at time of treatment, and for seventeen years, had been a complete invalid. As the result of a few weeks treatment by psychotherapy, she was restored to a normal state of health and for the past two years has been leading a normal life in her home. The history is as follows:

Until the age of twenty-one, she had no illness of any importance, but she was looked upon as delicate, and any minor illness was a pretext for unusual solicitude and over zealous attention on the part of her parents. She attended school, played games and took a normal interest in her work both at home and at school; I was informed that her school work was above the average. After completing her High School work, she attended the provincial Normal School in order to qualify for the teaching profession. In 1901 she was employed as a teacher in a rural community in Nova Scotia. In 1902 she had some difficulties with the school trustees and was obliged to give up her charge. She returned home in the middle of the school session and was treated by her physician for a "nervous breakdown." She was kept in bed for two weeks and then rested at home and later at the seaside for several months. The symptoms which she recalls as having had at that time were general weakness, heavy sensation in feet, numbness of limbs, sleeplessness, anorexia and palpitation. In September, 1902, she had typhoid fever. She was febrile for three weeks and during convalescence she had a relapse. She apparently recovered but found that she was unable to move arms or legs. This was the beginning of a paraplegia which lasted for seventeen years.

At first the condition was looked upon as one of typhoid spine. In later years the attending physician looked upon it as a functional disability, but his therapeutic resources failed to

effect a cure. There is no doubt that the sympathetic interference of relatives was a factor in defeating the attempts of the attending physician to bring about a cure. During the seventeen years which followed, changes were of a minor character and in the direction of improvement. In the second year, for example, the muscles of the hands and forearms became relaxed and normal and she was able to feed herself, paint china, crochet and do fancy work. She spent many months in the local Hospital and in 1905 returned to her home and accepted her state as one of permanent invalidism. This was also accepted by her friends. In 1912 a further attempt was made to treat her and she spent thirteen months in the Victoria General Hospital, Halifax, where she received her full share of drugs, massage, electricity, thermocautery, etc. the usual programme for hysterical patients. Her condition did not change in any respect, and she returned to her home in the same condition as on admission.

During these years at home, she neither walked, nor attempted to walk, nor did she even lift her head from the pillow. She was tenderly cared for by her friends. Every morning she was lifted from her bed and placed on an invalid chair where she spent the day, and at night she was carefully lifted back to her bed. In early spring she was wheeled out on a verandah, which faced the main street of the town, and was the daily object of sympathy and pity to passers by throughout the warm season. And thus it happened that for many years she shared honours with the robins and the mayflowers as the harbingers of spring. Her daily life, however, was not idle; she painted, sewed, crocheted and read all kinds of good literature. Through the kindness of friends she accumulated a very respectable library. She kept up a very interesting correspondence with many friends and her letters were neatly written and full of humour. Through the kindness of friends she had installed in her bedroom, a telephone, the other end of which was placed in front of a methodist pulpit and she was thus enabled to be a constant though hidden member of every service.

I knew this patient when she was a girl at school and was fairly familiar with her history although I had not seen her professionally. On my return from overseas I made a special point of seeing her. My first inquiry from friends brought the reply that she was still living but that she was very feeble and that the end was

very near. On examination I found her pale and sallow, with an anxious expression. All the muscles except those of the hands and forearms were spastic. The legs could not be bent at the knees or hips. The muscles of the neck also were spastic and prevented the head from moving freely in any direction. When she wished to turn her head, she would ask for help and it was quite plain that the inability to move the head was due to spasticity of opposing muscles and not to paralysis. There was a hyperæsthesia and hyperalgesia of the skin all over body and an obvious fear of being hurt. There were no anæsthetic areas. The deep reflexes were all exaggerated; there were no abdominal reflexes. She complained of severe pain in back, legs and neck, *i. e.*, in the areas of spasticity. The legs were œdematous to the knee, being twice their normal size, easily pitting on pressure. There was not present a single emphatic sign of organic nervous disease. The œdema of the legs was a bit disconcerting. However, examination of heart and kidneys definitely excluded cardiac and renal disease and I concluded that œdema was due to stasis from long disuse.

Having decided that the case was functional, I announced in a very emphatic manner that her case was curable and that I hoped to have the privilege of effecting the cure. Her facial expression quickly changed from one of forlorn helplessness to that of genuine hopefulness. She stated that she often had a feeling that someone would help her and she expressed a hope that it would be me. I had her brought to Halifax on a stretcher and placed in a private hospital. Her friends expressed doubt as to her ability to stand the journey. The details of treatment may be now very briefly told. The first day was devoted to rest after the railway journey. On the second day I spent some time in describing some simple facts in connection with the anatomy and physiology of the nervous system and demonstrated to her that I knew that the various nervous paths were intact and that I was certain of a complete cure. My first seance consisted of grasping the head with my two hands, moving it from side to side and in an antero-posterior direction until the muscles were tired and were felt to relax. I then asked her to make the effort herself, assisting her less and less until I felt that she was performing the movements herself. I then said sharply to her, "Now you can move your head, you have already done it, do it again." To her great surprise she found that she had

complete control of all her head movements, the spasticity of the muscles disappeared, and what was most interesting, never became spastic again. It was the first time in seventeen years that she moved her head freely. Her delight was indescribable and the prospect of a cure was now a certainty.

On each successive day other groups were dealt with in the same successful manner. At the same time that spasm ceased, the pain also disappeared. For a time the œdema of the feet and legs threatened to defeat my efforts, but time and patience and perseverance won.

The various progress steps were as follows: On the third day she sat up in bed and in a chair without support. On the fourth day she stood on her feet at foot of bed. On the fifth day she walked across the room supported by the doctor and nurse. During the second week she walked up and down stairs except that she steadied herself by grasping the bannister. It was much easier for her to go up stairs than down. On the fourteenth day she took her first auto ride and walked to and from car with assistance of nurse. On the sixteenth day she found her balance for the first time and was able to stand alone. On the twenty-first day she got out of bed alone and walked around the room without any assistance. On the twenty-eighth day she left Hospital and went to a private home on the distinct understanding that she would do without a nurse. From then on she dressed herself, attended to her toilette, walked about the house and dined at the table. During the fifth week she took walks on the streets and in the public gardens. During the sixth and seventh weeks, she went shopping, attended church, theatres, etc. It was then, for the first time in her life, that she saw a moving picture, as there were no such things in operation when she went to bed.

At the end of seven weeks she returned to her home as an ordinary passenger stopping en route to spend a week-end with friends in a neighbouring town. You can imagine what a sensation she caused when she stepped off the train in her own town, where she was known as an invalid for seventeen years.

During the two years which have elapsed since treatment, she has been living a normal life, doing housework, shopping, attending church and theatre and calling on her friends. She has gained many pounds in weight and looks well.

The points worth emphasizing in the case are:

1. The patient was cured by psychotherapy alone. No accessory measures were employed. The first steps may be called therapeutic conversation, the object of which is to gain the confidence of the patient and prepare the soil for the reception and acceptance of suggestions. Then followed a series of requests to perform certain movements always accompanied by positive and emphatic assertions that she could do it. Finally a long round of re-educational exercises which led up to and included all the activities of a normal healthy life.

2. The patient could have been cured at any time during the seventeen years of invalidism by similar methods and on the other hand the paralysis might have continued to the end of the patient's life if left alone.

3. The clinical features were similar to the phenomena which can be produced by suggestion during the hypnotic and post-hypnotic states and in the waking state in some suggestible individuals.

4. The secondary changes such as oedema, deformity of toes, and change of postural tone in muscles interfered with the rapidity of cure. If these features had been absent, the cure in this case might have been brought about in a few days instead of a few weeks.

The principles of cure which are summed up under the name of psychotherapy have a wide range of usefulness in clinical medicine. Every physician is a psychotherapist consciously or unconsciously, but the principles can be used much more than they are. It is not even necessary to be a medical man in order to be a psychotherapist; a clergyman, layman or quack may make psychotherapeutic cures, but in doing so they are usurping the place of the properly trained physician who alone is qualified to differentiate between organic and functional disease, and thus select those cases which require psychotherapy and those who require other measures for relief.

EPIDEMIC ENCEPHALITIS—THE INFLUENCE OF HORSE SERUM IN TREATMENT—A PRELIMINARY NOTE*

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IF one seeks in the literature for assistance or suggestions, even, in the treatment of epidemic encephalitis, one will, I am sure, meet only disappointment. Though much has been written in the description of this disease, one must be impressed by the fact that very little has been done to help us in the treatment. One's feeling of helplessness in such cases is extreme. In my experience, the administration of hexamine has been absolutely useless, and it is very doubtful if it could be expected to accomplish anything. While I perfectly well recognize that from the small series that I have to report no definite conclusions can be drawn, it has seemed to me while these cases were under observation, that the results were definite enough to justify bringing this method of treatment to your attention. In the first case, a definite progressive and

severe type, the improvements following the administration of diphtheric antitoxin were so evident as to justify its use in further cases. The second case was already of long standing before admission to the hospital, and while the results were not so striking as far as the signs of the disease were concerned, there seemed to be an ameliorating action on the temperature and the progressive character of the disease. One can imagine the destructive processes at work were already too far advanced to be affected. In the third case the results were most strikingly satisfactory. A fulminating onset with all the evidences of the hæmorrhagic type of the disease, headache, beginning choked discs and the characteristic C.S.F. with marked improvement following so definitely on the administration of the serum.

The fourth and fifth cases were evidently of the polio-encephalitic type. Both showed a definite

*Read by Dr. Wm. Boyd.

improvement with the treatment, although the fifth case was left with a sequela in the shape of a partial anterior tibial group paralysis. In this case, considering the severity of the general symptoms one was rather relieved to get off so easily. The sixth and seventh cases were evidently fulminating cases from the beginning, and in these cases no results were obtained.

After the first case it had been recognized that the antitoxin was not the active principle. Horse serum was used. Whether its action as a foreign proteid or its hemostatic qualities are most beneficial, it is impossible to say, but I would suggest both factors might come into play. The influence on the temperature would suggest the beneficial action of the foreign proteid, while the disappearance of the signs of organic disease which have already appeared and have been progressing, would suggest the possibility that the more or less minute hæmorrhages so characteristic of the disease have been controlled.

The possibility of our having met with a milder type of infection towards the waning of the epidemic must certainly be considered. At the same time, I would point out that the last two cases were of the most severe and fulminating type, and also that we were careful not to use this method of treatment in cases that were evidently improving. The usual precautions against sensitized patients were taken where indicated.

CASE 1.—L. D. Female; aged 14; Russian Hebrew. Admitted, January 26th, 1921, under Dr. W. F. Hamilton. Discharged, June 17th, 1921.

Complaints.—Drowsiness and mental change. The present illness began one week ago with sore throat and stiff neck, then general malaise and drowsiness and a gradual developing stiffness of her muscles. Since yesterday she has not spoken and has taken little or no nourishment. Her personal and family history show nothing of interest.

On admission the patient appears to be semi-conscious and somnolent. She can be roused to stare uncomprehendingly but does not speak. She understands what is said to her but responds to commands slowly and inadequately. However, if raised and given a paper and pencil she will write her monosyllabic answers intelligently. When told to open her mouth, or her eyes, there is very slight movement of the lips or lids. When given a drink the fluid is allowed to collect in her throat, and no effort made to swallow or expel it. There is a marked catatonic rigidity, and the

limbs stay moulded in any position in which they are placed until they are passively replaced. There is rigidity of the neck, back and lower limb muscles to passive movements. The fundi are normal; the pupils are equal and active to light. The eyes stare in a forward direction but can be moved laterally with only apparently a strong effort. There is dorsal flexion of the right great toe (Babinski's phenomenon); the left is indefinite. The knee and ankle jerks are present. The abdominal and epigastric reflexes are all present. She has involuntary micturition. Lumbar puncture shows a clear fluid under a slightly increased pressure. There were forty cells to the c.m.m. practically all are lymphocytes. There is no excessive globulin. The Wassermann is negative. Examination of the nose showed a subacute rhinitis and there was also a chronic catarrhal otitis-media of the left ear. The heart, lungs and abdomen showed nothing abnormal. The urine, a catheter specimen, was acid, 1,040; a trace of albumen; no sugar; some acetone; microscopically, phosphates and many urates. Her blood count showed 7,400 white cells and 100% hæmoglobin.

Lumbar puncture was repeated on January 28th, and again on February 2nd and 6th, with practically the same findings as on the first examination, the cell counts varying between twenty and forty cells to the c.m.m. The patient appeared to be worse; was very dull mentally and more difficult to rouse. Involuntary micturition continued and the patient was put on an air bed. A greasy sort of perspiration was noticed on her face at times.

On February 7th, 1,000 units of diphtheric antitoxin was administered subcutaneously and this was repeated two days later. On February 11th, a lumbar puncture was done and the examination of the C.S.F. showed 110 cells to the c.m.m. At the same time, 1,000 units of diphtheric antitoxin were given. At this time examination of her nervous system showed a mental condition which strongly suggested negativism. If the patient were told to open her eyes she closed them, and if told to open her mouth she shut her jaws tightly. The condition of catatonia was still exhibited. The knee jerks and ankle jerks were active. There was a bilateral extensor response (Babinski) and there was a tendency to contracture of the calf muscles and ham strings. Four days after the first injection of diphtheric antitoxin, the temperature, which had been running between 99° and 101°F,

came down to normal for the first time, and from then on it remained normal, with occasional slight rises, during the following three weeks. Her mental condition became brighter, and on February 17th, it was noted that she voluntarily attempted to move her limbs. On March 5th, she spoke out loud for the first time. Examination of the C.S.F. at this time showed it to have a normal cell count. The lower extremities, however, were very much contractured, and rather severe bed sores formed on the sacrum. The facies suggested very strongly the fixed rigidity characteristic of Parkinson's disease, and there was slight tremor of the hand. The voice was somewhat monotonous and suggestive of the same condition. These conditions were overcome, or cleared up, before her discharge on June 7th. The patient has continued well since. When seen a year after her discharge, there was only the slightest suspicion of a Parkinson facies. The pathological reflexes had all disappeared.

CASE No. 2.—M. N. Female; aged 45; Irish. Admitted, March 7th, 1921, under Dr. W. F. Hamilton.

Complaints.—Nervousness, drowsiness, diplopia, loss of memory

Onset, six weeks ago with diplopia and then an inability to concentrate on any undertaking, with loss of interest and ability to care for her home. Some difficulty in articulation developed. She feels drowsy all the time. The personal and family history showed nothing of interest. There was nothing pathological in the respiratory system nor in the cardio-circulatory system save that the pulse was continuously rapid; about 110. The abdomen was negative. The urine showed nothing abnormal. Examination of the blood showed 4,700,000 red cells, and 7,200 white, and 100% hæmoglobin. B.P. 165 systolic, 100 diastolic. Examination of the nervous system showed the optic discs normal. Pupils equal and react to light and accommodation. The ocular movements are limited in outward movement in either eye. Upward movement in the right eye is limited as compared to the left. Lateral movement is accompanied by a coarse nystagmus. Upward movement also, but this is of shorter duration. There is a suspicion of relative immobility of the facial muscles. The patient states that her mind is not as clear as formerly, and since the onset of the double vision she has been very sleepy, falling asleep almost on her feet. Spinal fluid was under some increased pressure, contained 15 cells to the

c.m.m. but no globulin. The Wassermann was negative in both her blood and C.S.F. The patient gradually became rather more somnolent, and the expression of her face more mask-like. The pupils on March 18th, did not react to light or accommodation, but her condition otherwise remained about the same. However, with the increase of the lethargy the spasticity of the muscles became more marked. At the same time her temperature, which had been running along just above and below normal, became generally more elevated, averaging about 100° F., so that on the 26th of March, she was given 1,000 units of diphtheritic antitoxin. This was repeated on the 28th, 10,000 units being given. Her temperature following this showed a slight decline, but the patient still remained very stuporose. On the 31st, she was noted as being less lethargic and stupid. On April 1st, she was given 20 c.c. of horse serum subcutaneously, and from then on the patient seemed to gradually progress towards recovery, although contractures, which developed in the lower extremities, retarded her getting out of bed. The pulse, too, continued to remain very rapid even after the temperature had fallen to normal, and the fact that she had had a fractured patella with some separation of the pieces, of long standing, complicated matters somewhat.

On *discharge* on August 10th, she still showed the Parkinson facies and some contractures of the ham string muscles, and the pulse was still rapid.

CASE No. 3.—V. M. Female; age, 23 yrs; single. Was admitted to my service on September 8th, complaining of prostration, loss of memory with mental confusion, general weakness and fever, severe headache.

Onset.—The patient was perfectly well until September 2nd, 1921. On the steamer the second day out from England she had been enjoying herself dancing and going in for the games, feeling particularly well. In the morning she was found unconscious on the floor of her cabin and had evidently vomited. An overturned chair suggested that she had struck her head in falling, but there were no bruises. She remained unconscious for two days. On regaining consciousness she would answer questions in monosyllables; would not talk much unless spoken to, but then answered perfectly correctly and in a set phrase. No personal or family history of interest. Her temperature was 101° F.; her pulse was 60. Examination of the blood showed 13,200 white cells to the c.m.m. Examination

of the heart, lungs, abdomen and kidneys showed nothing abnormal.

On admission, the patient was dull mentally, she had loss of memory for all events at the onset of her sickness. Her memory for other times was more accurate, but she was unable to concentrate enough to correlate things and people, and soon forgot what she was talking about. The fundi showed some slight obscurity of the optic discs suggesting the beginning of a papil-œdema. There was some rigidity of the neck, but otherwise the muscular system and sensory system and the reflexes showed no abnormality.

On lumbar puncture, 15 c.c. of clear yellowish fluid were withdrawn under slight pressure. There were 52 cells, all mononuclear or epithelial to the c.m.m. There was excessive globulin. There were no red blood cells, and evidently the yellowish colour was due to blood pigment. 10 c.c. of horse serum were administered subcutaneously on the 9th of September. The temperature gradually came down to normal and the pulse rate which was below 50 at the time of lumbar puncture gradually came up to normal, so that by the fifth day after admission, both pulse and temperature were normal, the headache had entirely disappeared and the patient made an uninterrupted convalescence. An easy mental fatiguability and a lack of power to concentrate were the only remaining symptoms. She was discharged on September 30th, apparently quite cured, and has remained well ever since.

CASE No. 4.—L. M. Male; age, 10 years. Admitted to my service on November 5th, complaining of fever, night terrors, stiffness and pain in the neck. The present illness developed about one week ago. After a game of football he felt poorly for two days although he still went to school. Five days ago, however, he had to stay away from school on account of dizziness, but was able to play around the house. The next day he was worse. Had a temperature of 101°, complained of pain in the back of the neck. He was very restless at night and was haunted with terrifying dreams. For the last two days he cried most of the day, picking at the bed-clothes, wakening out of any sleep in a great fright and complaining of pain and stiffness in the back of the neck and limbs.

His personal and family history presented no details of interest. Examination of the various viscera showed nothing abnormal. The cranial nerves were all normal; the muscular system showed no atrophy; power was good with no

incoordination. There was rigidity of the neck and Koernig's sign was quite definitely positive. Sensory system showed no impairment of sensibility. The tendon jerks were all equal and active, the plantar flexion right and left. Lumbar puncture showed a clear, colourless fluid under no pressure with 55 cells to the c.m.m. all lymphocytes. There was no increased globulin. The temperature was 100° on admission; the pulse, 80. Ten c.c. of horse serum were given subcutaneously. The following day the patient's temperature had come down to normal where it remained. The rigidity of the neck disappeared but he still complained of pain in the legs and it was discovered a day or two later that he had paralysis of the anterior tibial group in the left leg affecting all the muscles of that group. For the first three days in the hospital there was noted a slight twitching of the muscles in both arms and legs especially during sleep, but this afterwards disappeared.

While one cannot say definitely that this was not a condition of acute poliomyelitis, the presence of the symptoms attributable to the brain, and the fact of the epidemic of encephalitis suggested that infection rather than a diagnosis of poliomyelitis. The condition was looked upon as of the nature of an epidemic polio-encephalitis. The paralysis of the anterior tibial group has cleared up partially under electrical treatment.

CASE No. 5.—M. G. Male; aged 12; Hebrew. Admitted to Dr. Martin's service, August 13th, 1921, complaining of weakness of the legs, arms and hands and difficulty in walking. His present illness began on July 31st, when he complained of a headache, general malaise and a chilly sensation. The next day he had no appetite and vomited and was put to bed where he remained all that week with the same symptoms. Insomnia later developed. During the next week he felt loss of power in his legs and arms and when he got out of bed on August 11th, he was unable to walk without staggering. His mother noticed a slight drooping of the left eyelid for the past week, but there was no complaint of double vision. Apart from this extreme weakness in the arms and legs the patient felt better on admission than he had previously. His temperature was 99-1/5th, the pulse, 110, respiration, 23.

His personal and family history showed nothing of interest. Examination of the various viscera showed nothing abnormal. Examination of the nervous system showed fundi normal, pupils react to light with a slight drooping of the left eyelid.

but ocular movements were otherwise normal. The left eyelid does not move up to quite the same extent as the right. The cranial nerves are otherwise normal. The muscular system showed no atrophy. There was, however, definite loss of tone in all the muscles in both upper and lower extremities, with great weakness but no definite paralysis of any movement. There was no sensory loss to be observed anywhere. The tendon jerks in both upper and lower extremities were not obtained; the plantars were flexion right and left; the abdominal and epigastric reflexes were present; there was no loss of control of the sphincters. Examination of the blood showed 4,250,000 red cells, 18,000 leucocytes, 80% hæmoglobin.

The weakness of the extremities became progressively worse; a bilateral wrist-drop developing after exertion. Three injections of 10 c.c. of horse serum were administered subcutaneously on the 19th, 21st, and 25th. This was followed by a gradual improvement in the strength of the extremities, so that by September 7th he was able to stand and walk, and by the 21st he was rapidly gaining in muscular power and could walk about the ward quite well. He was discharged on September 30th. A week later, however, he was re-admitted owing to a recurrence of the muscular weakness following exertion on his return home. Rest in bed and massage, however, quickly brought about a recovery of power and he was discharged completely well two weeks later.

CASE NO. 6.—A. E. Male; aged 42; married. Was admitted under Dr. A. T. Henderson on November 23rd, 1921.

Complaints.—Headache, stiff neck, double vision.

Present illness.—For the past week the patient has been tired and restless and has not been sleeping well. Five days ago he felt worse and stayed in bed all day. He complained of drowsiness. The next day he developed some pain in the back of the neck. On November 21st the patient went to his office although complaining of severe occipital headache. He managed, however, to work the whole day. On November 22nd he was seized with sudden forcible vomiting. The vomitus consisted of greenish liquid. The vomiting was continued six times on the day of admission. The headache was most severe. The gait has been staggering on any attempt to walk in the last two days, and he sees double. The heart, lungs and abdomen showed nothing pathological, and the urine was not abnormal.

Examination of the nervous system showed a restless irritability and he was very difficult to examine. Fundi normal; pupils equal and react to light and accommodation. He has diplopia for near and distant objects. A coarse lateral nystagmus on looking to either side. Marked photophobia. Some dysarthria. The patient seems sleepy and yawns a great deal.

Muscular system showed normal tone; the power good. No wasting. There is considerable incoordination in the right arm and leg, finger-nose and knee-heel test. No loss of sensation could be made out, and no loss of sense of position. Tendon reflexes were all equal and active; the plantars flexion right and left. Abdominal reflexes equal and active on both sides. Lumbar puncture gave a clear fluid withdrawn under some pressure. Showed 20 cells per c.m.m.; all lymphocytes; no increased globulin. His temperature on admission was 99-2/3; pulse 72. Ten c.c. of horse serum were administered subcutaneously. He became more drowsy and difficult to rouse and had to be catheterized. Suddenly, on the day after admission he became very cyanosed, choked up with mucous, and died. No autopsy was permitted.

CASE NO. 7.—A. S. Male; aged 65. Admitted to my service on March 16th. Died March 22nd, 1922.

Complaints.—Paralysis of the upper and lower extremities. Some mental confusion at times.

Present illness.—Began ten days ago with severe cold in the head and chest, associated with fever. The bowels were constipated. He was confined to bed. Four days prior to admission he complained of some soreness in the muscles of the upper and lower extremities with definite weakness in the right arm. The condition gradually increased and two days prior to admission he became definitely paralysed in both lower extremities; both upper extremities were also severely affected. Constipation still persisted and no movement of the bowel could be obtained in spite of cathartics. Mentally the patient was somewhat confused and disoriented, extremely restless and irritable. There is nothing in the personal family history bearing on his present condition.

Present Condition.—The patient is a poorly nourished elderly man, mucous membranes pale, with a general appearance of being seriously ill. Examination of the ears, nose and throat was negative. No enlargement of the lymphatic glands. Pulse 80; regular in rhythm and volume.

Vessel walls tortuous and palpable. The heart showed no enlargement and there were no adventitious sounds; the chest was rather emphysematous in type. There is relative depression in the right subclavicular area. Very little expansion of the chest anywhere. The breathing was practically altogether abdominal. Some relative dulness over the apex anteriorly with a suspicion of blowing breathing over this area. The fundi are normal; the pupils equal, reacting sluggishly to light, probably due to the effects of morphia. The other cranial nerves showed nothing abnormal. The skin everywhere is loose and flabby, suggesting that there has been considerable loss of weight. The muscles are also generally flabby. There is definite weakness in both deltoids, triceps and biceps more marked on the right side than on the left. The forearm and hand muscles on both sides show very definite weakness, although there is no absolute paralysis in any muscle. There is no definite incoordination or involuntary movement. The muscles of the lower extremities show a similar condition. No impairment of sensibility could be made out. The tendon jerks of both the upper and lower extremities were not obtained. Plantar responses were flexion in both

sides. The abdominal and epigastric reflexes were not obtained.

The urine had a specific gravity of 10.19; it was alkaline; there was no sugar and no albumen; there was incontinence. Examination of the C.S.F. showed a normal count; 3 cells to the c.m.m. pressure was not increased; globulin was present.

The day following admission showed a gradual increase in weakness of the affected muscles. Articulation became indistinct. The patient was very irrational. Did not recognize anybody. Neither enemata nor cathartics nor pituitrin were effective in overcoming the constipation. He received 10 c.c. of horse serum on the day following admission, and again three days later, with no appreciable results, as the patient died six days after admission.

Autopsy showed microscopically a very marked oedema of the brain and cord, with extreme and extensive softening of the cord. On one section of the brain, microscopically, it showed marked congestion of the vessels, and what appeared to be small petechial hæmorrhages.

Microscopic examination of this case was not completed.

The Atonic Abdominal Wall.—The attention of Chesney Ramage, Fairmount, W. Va., was directed to this condition by a large number of strong, healthy coal miners who complained of all known ills and had in common an atonic abdominal wall. The symptoms, as a rule, are general abdominal discomfort, headache, discomfort after meals, constipation and abdominal pain after lying down, relieved toward morning. There is absence of anorexia, abdominal tenderness on palpation, leukocytosis, fever, anemia and impotence. Physical examination constantly revealed good general nutrition, extreme bulging of the lower half of the abdomen, and remarkably poor tone to the rectus muscles of the abdomen. This was made especially noticeable in men who were muscled like Hercules, men engaged in the most arduous toil whose deltoids were huge blocky masses, and whose backs and thighs were hard and corded. The question arose as to why this group of abdominal muscles should

be so attenuated. Lack of use, and therefore lack of tone to the muscle from some intra-abdominal condition apparently was the cause. The most reasonable working hypothesis appeared to be that there was a voluntary inhibition of the abdominal musculature on account of the pain of their pull on a broken rib to which they were attached, or during the period of acute abdominal pain when their relaxation gave relief to the patient. As long as the local condition causing the relaxation existed, naturally, the inhibition to the nerves controlling these muscles would continue. Ramage has depended for a cure almost entirely on exercises tending to develop the abdominal muscles. The best exercise appeared to be to lie supine on the floor and rise to a sitting posture without the use of the hands. This was to be practiced assiduously morning and evening to the limit of the patient's endurance. The results are surprising.—*Jour. Amer. Med. Assoc.*, June 17th, 1922.

MEDICAL ORGANIZATION*

T. C. ROUTLEY, M.B.

*Secretary, Ontario Medical Association;**Associate Secretary, Canadian Medical Association, Toronto.*

IT is sometimes said that the physician is a barnacle on the ship of society because he does not add to the production of the community. This statement is not founded upon truth. As a matter of fact, the physician is one of the greatest producers in his individual locality. This may be proved by the following statements—The average wage-earner is worth to the state between \$3,000.00 and \$4,000.00 a year. In a group of 1,000 people (the average number of a physician's clientele) it is reasonable to estimate that 200 will be wage-earners and as such (applying our minimum figures) are worth to the state \$600,000.00 per year. It is not at all out of the way to estimate that the efficiency of the country's producers is kept at least at a 10% higher level by the medical profession than would obtain were the profession not functioning. Accepting this hypothesis, the average physician is shown to be a producer to the extent of \$60,000.00 per year in his community. This estimate, moreover, does not include the value of the lives he may save or the protection he renders the potential producers who pass through his hands. The physician is not only the keeper of the health, and therein much of the happiness of his patients, but from an economic point of view he is one of the country's most valuable assets.

For reasons best known to themselves there are a great many individuals who would like to enjoy a place in the community on a plane with practitioners of medicine, but it is doubtful how altruistic are their aims or objects considering their qualifying requirements. The prospectus of the Canadian Chiropractic College, an Institution which recently sought legislation from the Ontario Government, presents the following illuminating information in reference to the requirements demanded of its students and graduates:

"Our educational requirements of entrance are not exclusive nor yet exigent; TO BE ABLE TO

READ AND WRITE IS ALL THAT IS NEEDED. We consider that one is better qualified to learn and practice chiropractic if he is able to drive a screw or tighten a bolt. We know that neither M.D.'s nor Osteopaths are as well fitted to take chiropractic as those without their previous studies, as the latter have no medical cobwebs to be removed from their mental capacity. Our examinations must be passed with at least a minimum of 75%. Though they are apparently stringent, all can pass them successfully under our careful instructions."

"Chiropractic is the safety valve for the middle-aged worker of every class. When one's productive ability begins to wane, before that time, and even after, look for a new vocation. No matter what your employment has been break away from the tingle of the alarm clock. Chiropractic offers you the best opportunity of getting your nose away from the grindstone. Take up chiropractic and secure your haven."

"The daily compulsory attendance at the College is from 9.30 a.m. to 12 noon, five days in the week for the first six months, and attendance during the last six months from 6 p.m. to 8 p.m."

From the foregoing it will be observed that this wonderful course, extending over a period of approximately 600 hours, makes it possible for the most illiterate (young or old) to become a "Doctor" in seventy-five days (of eight hours each) and be put on a plane of professional equality with practitioners of medicine, who have spent many years to qualify.

Sometimes our profession is prone to say that it is beneath our dignity to take any steps to expose such fraud or in any manner bring the facts before the public. Possibly too, we have feared that our objects in so doing would be misconstrued, the public charging us with selfishness and with an endeavour to protect our own interests. However, when we calmly consider what a menace to humanity such ignorant charlatans and parasites are, public duty demands that we

*An address to the Medical Society of Nova Scotia, Sydney, N.S., July 6th, 1922.

openly express our condemnation and disapproval of the exploitation of our fellow men. There is no other class in the community either sufficiently qualified or interested to bring the facts before the public. The onus obviously and most seriously rests upon us.

What is wrong with the world to-day? In every land there appears to be considerable restiveness and unsteadiness which can only be attributed to one cause, *viz.*, the state of mind of the universe. The natural resources of the world, our wheat fields, our mighty forests, our minerals and our fisheries, are still with us, but there is undoubtedly an impairment, temporary we hope, in the mental outlook and balance of the people. The medical profession has a great opportunity to assist in the regaining of such mental equilibrium. Our individual and united forces can be far more reaching than the most sanguine of us could estimate. It behooves us to so unite that we may do our full share in this biggest of tasks, the getting back of our people to a calmer and saner outlook on life. To accomplish the greatest amount of usefulness in the community the medical profession must be organized.

ORGANIZATION

The keystone of medical organization is the local unit or the County Medical Society. The practitioners of every locality must be organized into active units. When 100% of the medical profession of this province, and all provinces of the Dominion, realise their responsibilities and, furthermore, their privileges, there is practically nothing which we cannot achieve in the highest interests of our noble art. To none in the community is given the influential position enjoyed by the family physician. When united in their counsels, physicians can wield a great influence on public opinion. I cannot too strongly urge upon you not only the advisability but the duty of your carrying on most unremittingly until your organization has obtained the membership of every eligible practitioner in the province.

To obtain members is possibly the easiest part of the task. To hold members requires a fulfilment on your part as an organization:—to render service of sufficient character to prove to your members that the advantages both tangible and intangible in a Provincial Medical Association demand their continued allegiance.

One practitioner in discussing this matter was led into the position of stating that during the

last year he had paid out \$175.00 for protection in accident, health and automobile insurance. During the year he had lost no time through sickness or accident nor had he any mishap with his car. When asked the question had he not wasted his \$175.00 his answer was a decided "No, during that period of twelve months I have had protection well worth the investment." A medical society cannot obligate itself as an insurance company, but when the rank and file of practitioners fully recognise that their prestige, their dignity and their professional standing can be protected by an organization of themselves our problem of completely organizing the medical profession will be solved. The investment of \$10.00, \$15.00, or \$25.00 as the case may be, will appeal to the thinking man quite as logically as his accident or motor insurance. In this argument service and sentiment are entirely ignored; plain, selfish reasons are advanced. The other side of the picture, the one which really counts, is the power for service which can be employed by an organization to effect results for the profession as a whole and for the individual members in particular. Surely in this we have a dual appeal; sound business, and high sentiment, reaching out, requesting and urging all practitioners to come in.

PROPAGANDA

The work of a medical association naturally divides itself into two phases, *viz.*, within the profession and without. There is much room for criticism in our treatment of the public. We have failed to take them into our confidence. There should be no air of mystery surrounding our profession, nor in truth is there such, but the great bulk of the public has felt, and still feels, that we have many secrets locked up in our hearts which we consider better that they should not know. This must be dissipated. Let us put ourselves fairly, frankly and honestly on record. The newspapers and periodicals can and will gladly help us providing we give them the right kind of material. Give the press facts, not fancies nor fallacies, and in time public confidence will be inspired and our efforts truly appreciated.

COUNTY SOCIETY MEETINGS

The local units should be urged to meet regularly; frequent meetings maintain and increase interest. There are doubtless many practitioners and teachers in this province who would be willing to give of their time and talent

to their fellows by way of post-graduate lectures. To all such an opportunity should be given; a schedule should be completed and the county societies encouraged to cooperate. This is a tangible illustration of giving the member something for his money.

In the Province of Ontario during the past year 230 such lectures were given. The Ontario Medical Association was greatly assisted in this work by the Ontario Division of the Canadian Red Cross to the extent of a munificent grant of \$5,000.00. The gift has been repeated for this coming year. It must be obvious to all that the worth and value of this type of work cannot be over-estimated while the benefits to be reflected on the general public have apparently been appreciated by a lay organization whose help has so generously and freely been given. These county society meetings and post-graduate lectures not only keep the practitioners abreast of the times, but they make for a greater spirit of harmony amongst the profession.

DISTRICT MEETINGS

It is almost impossible for a large proportion of medical practitioners to attend the annual provincial meetings. As a matter of fact, an attendance of 20% to 25% is a fair average. It is well then to consider the advisability of holding one or two-day meetings during the year in different parts of the province, several counties meeting together in the form of a district association. Ten such district associations have been established in the province of Ontario. Last year most successful meetings were held in nine out of the ten giving many an opportunity to be present who could not get away to the larger annual provincial meeting. No doubt in the province of Nova Scotia similar distribution of territory can be worked out thereby creating and stimulating keener interest in the work of the Association as a whole.

TARIFF

It was found in the province of Ontario that the tariff varied considerably, practitioners in one county working for 10% to 20% less than practitioners in another county. This information was carefully tabulated and a strong committee appointed to review the matter and bring in recommendations. The result has been that a uniform basic tariff for the province has been adopted, which will no doubt work out to the

mutual advantage of practitioners and public. If you have not made a provincial study of your tariff I would strongly advise your doing so.

LEGISLATION

If cults and pathies innumerable and sundry continue to gain a foothold in this country, one of two reasons must be admitted; either that a credulous public is being mulcted and deceived or the medical profession is failing to render proper service. If the former is true the fault is ours, while if the latter should be the case, the greater condemnation is upon us. The Chiropractors of Ontario applied for a Bill of Incorporation at the last Session of the Provincial Legislature. The Ontario Medical Association realising its duty told not only the members of the Legislature, but the public, the menace which was lurking on the horizon, and the great dangers which would follow granting any legalised standing to Chiropraxy. The Chiropractic Bill was thrown out by the unanimous vote, so far as could be ascertained, of the Private Bills Committee representing eighty-five members out of the 110 in the House. We are not at all sure that had we as a profession failed to do our duty, the result would have been such as here stated.

DOMINION ORGANIZATION

Some few months ago it was discovered that the Dominion Government had granted a course in Chiropraxy as vocational training to returned soldiers. Your Canadian Medical Association on learning the facts immediately took steps to impress its viewpoint of this dangerous and unwarranted action upon the Government. Medical Associations from coast to coast upon being advised, promptly expressed themselves by interviews, telegrams and letters to the honourable Minister of Health with such effect that before many days had elapsed from the time of our first interview with the Minister of Health we were advised by the Government that no further courses in Chiropraxy would be granted. This is tangible evidence of the value of a dominion wide organization.

STANDARDIZATION OF DRUGS

In the treatment of the sick there are three factors to be considered, *viz.*, the diagnostic ability of the physician, the recuperative powers of the patient and the treatment administered. Just as no chain is stronger than its weakest link

so too in the treatment of disease it must be admitted that the prognosis depends upon the efficiency of all the factors mentioned. If the treatment employed only does 50% of the work which it is intended to accomplish, it is obvious that the patient suffers. A year or more ago it was pointed out to the provincial Associations that many of the drugs being used by the profession were not physiologically standardized; in many instances tinctures were found only 50% efficient. When the attention of the Federal Government was drawn to this matter we were informed that no action would be taken until a demand sufficiently strong was voiced by the profession. From coast to coast the subject was discussed with the result that from the Canadian, Provincial and smaller Medical Associations came such a deluge of requests that the Government has seen fit to establish a Bureau of Standardization, and we are informed that during the coming year many of the important tinctures will be standardized, guaranteeing to the profession that they are 100% efficient. This is an achievement for organized medicine, the value of which to the public as well as to the physician cannot be overestimated.

CONCLUSION

There are many additional points which might be emphasized in urging the profession to unite. To each one of you must occur every-day matters which call for unity of action. In the prob-

lems of Insurance Fees, Workmen's Compensation Board Relations, Temperance Laws, Contract Practice, etc. etc., we find opportunity for collaborative thought and action. I cannot too strongly urge upon you the advisability of pushing on with your provincial organization. Furthermore, I wish to impress upon you the value of the Canadian Medical Association to each and everyone of you. It is a dominion wide Association most zealously endeavouring to render every possible assistance to the medical profession from the Atlantic to the Pacific. The Great War gave Canada an opportunity to prove to the world the type of man the Canadian is. In their platoons, companies and their battalions the Canadian Army Corps was so thoroughly and efficiently organized that it proved itself second to none in the world. Let us as physicians in Canada so organize our local and provincial units, linking them up under the banner of the Canadian Medical Association, that we too will present to the world a united medical profession capable of giving the fullest expression to our opinions and doing our most effective work.

Gentlemen, this must be our objective. Let us hopefully look forward to the day when Canada will be a greater and better country with a happier, healthier and more efficient class of people because we took upon our shoulders the full responsibilities of our profession and our citizenship.

Malaria Control Operations in Relation to Ultimate Suppression of Disease.—C. C. Bass, St. Orleans, asserts that malaria has disappeared from large areas in this country and in other parts of the world, chiefly as a result of development of the country, including drainage and clearing of the forest, incident to agricultural and other industrial pursuits. Malaria prevalence is slowly but surely, decreasing over practically all of this country as a result of the steady march of civilization and settlement of the country. This process may be aided and hastened by antimosquito measures or by the proper use of quinin. Health agencies are interested in encouraging these measures. Our only present malaria control activities that actually lead to ultimate suppression of the disease are

permanent drainage and filling operations. All others are temporary and must be continued indefinitely, or the tendency will be toward a return to former conditions. The cost of intensive antimosquito operations for malaria control is so great that they have not been applied to a sufficiently large part of the total malarious area of the country to affect seriously the total prevalence of the disease. The cost of such malaria control as results from infected persons taking proper quinin treatment does not involve any cost over the amount that would be spent for other remedies. Therefore, it is applicable to the malaria problem of the country as a whole, and should be emphasized and encouraged by health agencies interested in malaria control.—*Jour. Amer. Med. Association*, July 22nd, 1922.

THE RELATION BETWEEN PHYSICIAN AND DRUGGIST AND PHYSICIAN AND PATIENT FROM THE VIEWPOINT OF MEDICATION*

V. E. HENDERSON, M.A., M.B.

Toronto

1. *The Physician's Relationship to the Pharmacist.*

A DIVISION of labour and responsibility in the preparation of medicines for administration to the patient was long recognized by both physician and pharmacist. In this province both parties have departed from that ideal condition and the tendency seems to be for them to depart more and more therefrom and to become less allies than rivals in administering to the medicinal needs of the sick in the community. The pharmacist and the vendor of patent and proprietary medicines is, I am convinced, doing more to decrease the income of the medical profession and doing more harm to the general welfare of the community than the osteopaths and chiropractors. The growth of this evil has been slow, and almost unnoticed, but it is time to call a halt.

I have recently analyzed 470 prescriptions written by physicians throughout this great country and dispensed in drug stores and hospital pharmacies. In no case was the simple rebottling of proprietaries counted, though in many cases this occurred, and even such prescriptions as

R Frosst No. 267 were found.

In these 470 I found forty-eight, or 10%, containing incompatibilities, usually due to the use of proprietary preparations whose composition was unknown or disregarded by the physician, for instance, Elixir Lactopepsin with digitalis or even with sodium bicarbonate.

Proprietary and non-official drugs were called for in 166 prescriptions, or in 35.3%. All together in this small number of prescriptions, seventy different proprietary and non-official remedies were required. You all know that the practice of the profession requires any pharmacist to carry on his shelves over and above the drugs of the Pharmacopœia hundreds of chemicals and proprietary mixtures, many of them expensive

and in many cases called for but seldom, necessitating a very heavy capital expenditure by the pharmacist and decreasing his profits greatly. Every time a physician prescribes a proprietary medicine which the druggist has only to rebottle there is a tendency to decrease the druggist's profit. When a manufacturer succeeds in getting a proprietary mixture established, he raises its cost to the pharmacist, who must either pass this on to the patient or decrease his profit.

The pharmacist says his dispensing counter does not pay and that therefor he is obliged to sell other things. Salesmanship becomes a more important part of an assistant pharmacist's training than a knowledge of drugs. Apprentices are not trained. Even the pharmacist's specialties are ordered from a manufacturing house. He learns little even about flavouring; the physicians use proprietary ones. The increased value of a qualified pharmacist as compared with a non-qualified apprentice is only about \$5.00 to \$7.00 a week, apprentices up to \$20.00 a week, qualified men \$25.00 to \$27.00. These facts have been ascertained by canvassing but a small number of men and may not be quite accurate but seem to be substantially so.

Further, the physician in a very large proportion of cases does his own dispensing. In many towns the druggist has been forced to become merely a vendor of proprietaries, specialties, cameras, cigars, candy, etc. I know that by doing your own dispensing the patient comes back to you when his bottle is empty, also that the druggist gets no opportunity to keep a stock bottle of your favourite mixture and recommend it to his patients. But were our allies the pharmacists loyal, this could be prevented by marking the prescription *ne repetatur* or "repeat twice only" as may be required. An honest pharmacist would never fill for Mrs. B a prescription issued to Mrs. A. But is the practice of doing your own dispensing really ethical? Is it in the

*Read at the Round Table, Ontario Medical Association, May 30th, 1922.

best interests of your patients? The pharmacist is supposed to be able to distinguish good from poor preparations and drugs; you are not. If you demanded that he were well-trained he would be able to do so. You know that to-day the druggist is apt to buy from the cheapest source just as are members of the medical profession and does not test nor check his remedies in any way, first because he is not trained, and secondly because he is not a professional man and does not care. In the old days he did so and took a pride in his knowledge of drugs, their sources and chemical reactions.

2. *The Relation of the Physician to his Patient.*

But let us turn to your relation to your patient. First, is it really in the best interests of your patients to do your own dispensing? Would it not pay you better to send your prescriptions to an honest pharmacist and train your patients to expect this practice?

By doing your own dispensing are you assuring to your patients the best and purest drugs that you can give them? Perhaps you are; perhaps you are doing as much as the pharmacist. In regard to the latter, we know that 73% of the *Liquor Arsenicalis* dispensed was found in the last survey by the Dominion analyst to be below strength, that *Liquid Extract of Nux Vomica* varied four times in strength, that *Tinctura Camphoræ Composita* and *Spiritus Camphoræ* were often below strength, and the pharmacist, though liable, blames the manufacturing house from which he obtained them. The products of the manufacturing houses have not been checked by the Dominion Department of Health at their source as yet. We should demand that these houses should be carefully surveyed and that the results should be made known to the profession promptly. Still, has not the old practice of having a trained man in charge of the actual dispensing a sound underlying basis? Is it not rational, especially in this age of specialization?

As errors in prescriptions are not checked by passing through the hands of a pharmacist, do not the physicians very often give small doses so as to avoid danger? Do they really give their patients medicines or *placebos*? I know many physicians who never weigh nor measure. They simply pour a little of this and a little of that into a bottle in a way they would not tolerate in a pharmacist. Is this fair to their patients? Does not the physician who dispenses *placebos* decrease his profits? Could he not train his patients to

do without drugs, where the physician considers them valueless? The modern tendency certainly is either to use drugs in quantities sufficient to produce results or not at all.

Many of us were not taught to write prescriptions and we save our faces and do not display our ignorance by not doing so but by dispensing a few roughly made up mixtures, by rebottling proprietaries or stock prescriptions and handing out manufactured pills and ointments or forcing the pharmacist to do the same. It is a temptation into which we easily fall because we have no great faith in our drugs. The proprietary preparation always contains drugs on the lowest scale, especially if the drugs are potent. Consequently, they, in many cases, are lacking in effect, are really *placebos*.

We were, many of us, bred in a period of therapeutic nihilism, yet we are the easy dupes of the vendor of patent and proprietary remedies, we will prescribe or dispense any new drug once or twice, uncritically, without taking careful records, without regard to the natural history of the disease. Sometimes we are for a time optimistic, a wonderful new cure has come into our hands but gradually it is abandoned, while more often it is given up at once, and our stock of it or that of the pharmacist is a bad investment.

In the past ten years some 300 new remedies or other preparations have passed the scrutiny of the A. M. A. Of these only a very few, perhaps twenty, have any real lasting value and will continue to be used and absorbed into the *Pharmacopœia*.

In my judgment, if physicians used the *Pharmacopœia* wisely, they would find that they needed only some ten drugs not included in it and these would include the *Arsphenamine* group and *Pituitary* as the most important members.

The physicians who have not learned the use of the *Pharmacopœial* flavours are as a consequence easily led to use proprietary ones to the financial detriment of their patients or themselves and to the glorification of the proprietary house and the deletion of the pharmacist.

I have watched with interest the advertising of many proprietary mixtures, for example, *Syrup Cocillana Co.* (Parke, Davis and Co.). It contains three extinct remedies, *Cocillana*, at one time included in the U.S.P. but deleted as valueless, and two valueless drugs, *Euphorbia* and *Wild Lettuce*, once used by the Eclectics. Its important constituents are heroin and squill. Yet physicians are using it. Every time it is

given to a patient he is not receiving that individual attention to which he is entitled. The chiropractor also gives the same treatment for all diseases. While discussing this matter with a group of physicians, the following incident occurred:

Dr. A. said to a brother practitioner, "Bill, do you remember seeing Dave Jones who had a cough?" "Yes." "You gave him a prescription." "Yes." "Well, I did not know he was your patient and when he came to me, I gave him a prescription for his cough. He looked at it and said, 'Dr. B. gave me the same prescription. It's no good.'"

Both physicians had prescribed the same proprietary. Both contributed to undermining the confidence of the patient in the profession, both to establishing the use of a proprietary. Had it seemed to cure, the patient would probably have learnt that he could buy it at a drug store without a prescription and would have advanced a step in becoming a prey to the proprietary house and the pharmacist.

Such, gentlemen, is the situation as I see it. Could we do away with patent and proprietary remedies, we would double the incomes of the

profession but more important still, we would greatly improve the health of the community. The unattended sick are largely those attended by the quack and the pharmacist. They come to us so late that we can not cure, at the best we can but patch them up temporarily.

There is no doubt that the large use that physicians make of proprietary medicines contributes greatly to their recognition and use by the public. A pharmacist justifying his sale of proprietary and stock mixtures to the sick said to me once, "You know Dr. A. He is a good man, I believe. But I can treat a cough as well as he can. He gives all his patients one of two mixtures, one if the cough is dry and the other if it is moist, and between the formulæ of these preparations there is no essential difference." The next step is for the patient to buy proprietary remedies without advice save from his neighbours. A vicious circle is readily established to the detriment of the health of the community and of the incomes of the medical profession and the druggists.

The Committee on Pharmacy has this problem before us as a great task. We want your suggestions and your help.

THE APPLICATION OF THE NEW PSYCHOLOGY BY THE INTERNIST AND GENERAL PRACTITIONER*

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THE New Psychology has given a special and much needed impetus to the study of the psychology of our patients; of the man himself, and not merely the symptoms of disease in various organs of the body. This study supplements, but must not replace, a careful history of the patient's illness and antecedent diseases, given as this is, from the physical standpoint mainly; a thorough physical examination follows. In the public wards of a Hospital, where the medical student gets most of his training, one meets with acute disease, and chronic organic disease in its

advanced stage. Even here, auto-suggestion and unconscious suggestion by the physician often aggravate the picture by adding a functional element. We must reassure and encourage such patients as far as we conscientiously can, taking in doubtful cases as optimistic a stand as possible.

The necessity for such reassurance and optimism is apparent. Christian Science scores its triumphs, not merely in functional, but also in organic disease, where so frequently fear and doubt cause the main suffering. We must ever consider not merely if the patient has organic disease, but also (a point often forgotten) if this disease is really causing all the symptoms. In

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private practice so often we find little to explain symptoms complained of; even focal infection may fail to satisfy. Let us not be satisfied with the facile diagnosis of neuralgia, neuritis, neurasthenia, or be misled by an innocent systolic murmur at the apex, or an apparent gastritis. MacKenzie insists on the frequency with which heart disease is diagnosed without justification, because of some unusual physical sign or symptom. His warning may well be extended to every organ of the body. If in doubt after careful examination, the physician should usually give the patient the benefit of that doubt. More real suffering is induced by a mistaken diagnosis of organic disease, than by occasionally overlooking it. This is not a plea for careless diagnosis, but is a considered protest against the too common view that there is no harm in warning a patient that he may have appendicitis, gall-stones, or what not, when there is little evidence to go on. Discomforts all too readily become disabilities under the fostering influence of suggestion. If it is considered a reproach for a surgeon to have a clean operation go septic, it is high time to protest against the physician instilling doubt and fear unnecessarily into a healthy man.

The radical difference between organic disease and the neuroses must be remembered. As Jones points out, organic diseases are the result of a conflict between man and nature, in the form of physical trauma, invasion of micro-organisms and involutionary processes, while neuroses are social diseases, the result of a conflict between man and his social environment. In other words, the neurotic is in trouble; he cannot adapt himself successfully to the claims and duties laid upon him by our complex social machine. In this dilemma, the neurosis is the way out, the means of escape, the irrational answer to the mental conflict.

Modern Psychologists—McDougall here joining hands with Freud—insist that the springs of human activity are the primitive instincts of self-preservation, and of sex; and the primary emotions of fear, anger, etc., are the affective aspect of these instinctive processes. The gregarious instinct—the instinct of the herd—early appearing in our ancestry, makes the mind of the individual specifically sensitive to external opinion, and confers on the precepts of the parents, the community and the nation at large, the sanction of instinctive force.

The development of the mind is essentially

social; on the egoistic infant, with its instinctive impulses, repressive forces are brought to bear in the home, enforcing standards of discipline, taste and morality. Thus arises mental conflict; a conflict between what the child wishes to do and what the traditional standards of thought and conduct in society require it to do. The personality of the individual is thus the resultant of his instinctive tendencies and his experiences.

In the development of the personality, the emotional life of the child is of the highest importance. The child's growing emotions are centred in the family circle, and "pattern" sentiments of love, hate, etc., are forged there, fateful for the future development of the child. At puberty, the family attachments are sacrificed for an independent love life. Now, among our patients, we find many an only child, a spoiled darling, wedded to the father or mother image, moulding and distorting all later attachments according to this early pattern, or actually incapable of any love life outside the family.

Thus, a married woman of 34, with 2 children, is nervous and sleepless, feels weak and dizzy, dreams much; physical examination quite negative. She complains that "nobody protects her, nobody saves her from worries and shields her as her father used to do." Her husband, a very decent fellow, saved her all he could, and she had an easy time, but like a child, she was unable to face her ordinary domestic duties, and day dreamed of the happy irresponsible time of childhood.

So too, the homes with a domineering father and two or three unmarried daughters bear tragic witness to the same situation. In one such case recently, the mother at home with three unmarried sons, had fought strenuously for years against any suggestion of their marriage, and actually developed a neurosis when one of them set up house on his own account. The difficulty is usually to recognize that the local symptoms, the headache, nausea, pains, etc., do represent the unconscious response, the appeal for help of the socially inadequate individual.

One does not often meet with so obvious a case as I had recently—a young man able to eat everything at home—however indigestible—but unable to join ladies in a light supper owing to intolerable nausea and vomiting; he had frequently to make his excuses and go home.

To cite another case: a married woman of thirty-three had suffered for years from vaginismus, for which three operations had been per-

formed; a dilatation, a dilatation and cutting operation (both severe and painful operations, she said, and quite unsuccessful), the third operation, she remarked, was a dilatation, very slight compared with the first two, but completely successful. On asking her what happened before the third operation to render it so successful, she answered with a half shrug of the shoulders, "He became engaged." She had married a man seventeen years her senior, who was well fixed financially but with little education, and had been in love with another man though they played the game. But the body's "I will not" was stronger than the "I will" at the altar, until the spell was broken by the man's engagement.

So too, sexual anæsthesia in women is rare in a "love match", though common in a marriage of convenience, and the history of such anæsthesia may give a hint to the physician of possible wedded unhappiness, which is responsible for many a physical ache and pain. Some years ago, I saw repeatedly in consultation a married woman, who suffered from recurring violent headaches for which morphine had been repeatedly given; the headaches were considered of serious organic origin. I found a large library (recently acquired) dealing with Spiritualism; a hint of domestic unhappiness, later confirmed by separation proceedings.

In the General Hospital at present under my care, is a married woman of thirty-five, educated in a large English town, married to a Canadian, and living on a lonely farm. A succession of crop failures and her husband's poor health since his return from overseas, have brought matters to a climax; she has no physical disability beyond being a little below par, yet the history given to the house physician told only of physical illness and pain, and gave no hint of her utter hopelessness in regard to the future—the dominating factor in the case. Unable to face the situation, she has taken refuge in invalidism and is on the borderland of a psychosis at the present moment. In such a case, the patient is more or less aware (though she may not volunteer information) that the root of her disability lies in her troubles, and these are unhappily, so real and serious that we cannot help her much.

In other instances, the patient has no idea that certain experiences, remembered perfectly, have anything to do with the symptoms complained of, so the physician's materialistic attitude and diagnosis of organic disease are welcomed to

silence the glimmering recognition by the patient that his worries are responsible. Thus last year, I showed at the Medical Society a young man condemned to invalidism by his medical attendant in the country. The patient, eighteen months previously, had been seized at 4 a.m. with a heart attack; pain, palpitation, and suffocation. Three months in bed were followed by seven months' convalescence at the Coast; then after a few months' clerical work, another attack occurred, after which he was advised by the doctor to give up his position, and actually did so. His heart was normal, he had walked twelve miles in three hours on the afternoon preceding his first attack, without any discomfort, had gone to bed well but could not sleep from midnight to 4 a.m. During these hours he was hopelessly fighting an impossible situation; an ardent Protestant, he had drifted into an engagement with a Catholic and now bitterly regretted it, but saw no honourable way out of his difficulty. His heart attacks, symbolically enough, represented the conversion to the physical sphere of his inner difficulties. The final heart attack, a month before I saw him, in fact solved his problem, for the engagement was broken off by the girl's mother when apprised of his serious physical condition. But this happy solution was possible only by the unconscious co-operation of the medical man.

In still other instances, the disturbing episode has been quite forgotten and is recalled to consciousness with difficulty, or possibly only under certain special conditions. It is unfortunate that Freud aroused so much antagonism by his insistence on the purely sexual origin of the neuroses; a one-sided ætiology sufficiently disproved by the war neuroses, which depend on the disturbance, not of the sex instinct, but of the instinct of self-preservation. For this antagonism has largely blinded the profession to the enormous importance and the general truth of Freud's conceptions of the unconscious, of mental conflict, repression and forgetting, and of the influence of unconscious factors in disease. These conceptions have been admitted, not only by psychiatrists, but also by leading psychologists, who in the World War turned from the investigation of healthy individuals in their laboratories, to the study of shell-shocked patients in the hospitals. A recent article by Henry Head on hysteria, shows similarly the influence of Freud.

Insisting on rigid determinism in our mental life, (no new conception), Freud points out that

the phenomena of our mental life are quite unaccountable, if we consider only the content of the individual's consciousness, for continually there arise ideas, impulses, prejudices, and beliefs which seem to come from nowhere. Freud proves by many examples that slips of the tongue and pen are not accidental, but represent valid psychic acts which arise through the mutual interference of two different intentions. In the same way the forgetting of impressions and experiences which are unpleasant is common enough. Darwin records that he found it necessary to write down at once facts at variance with his theories, as they tended to escape his memory. In the neuroses also, there is difficulty in the adjustment of appetites and desires to the demands of convention and morality; a difficulty met by forgetting—repressing from consciousness—thought or memories with emotions which are unpleasant or incompatible with one's standards of thought and conduct. Forgetting here is an active process; in some cases essentially a conscious activity, but in others, wholly or largely an unconscious process both in actual forgetting and in resisting the normal tendencies of association of ideas and voluntary effort to recall the memory to consciousness. The experience forgotten is the *immediately* painful and the ultimate consequences may be more unpleasant than if we faced rationally the whole situation at once.

But it is impossible to repress without serious consequences to mental life, a system of ideas tinged with strong emotional content. For the repressed complex (as such a system is called) seeks continually to express itself; the idea may remain successfully repressed from consciousness, but the emotion, dissociated from the original idea, may appear sometimes in the form of unreasoned fear or anxiety, sometimes converted into headache, vomiting, neuralgia or paralysis. Face to face with these symptoms, the physician so often thinks only in terms of organic disease—"the man above the eyebrows" is forgotten. There is too the blind spot in the patient's mind, and the ever present tendency in all of us to rationalise; to act or think on impulse, yet to assume that we are purely rational beings, and to defend our impulsive thoughts and actions by elaborate reasoning, deceiving ourselves and others.

A little introspection and self-analysis will help the physician, and will humble him sufficiently to bear with the apparent sophistry of his patient. For the patient's confidence and good-

will must be secured by the patience and sympathetic understanding of the physician. To face unpleasant facts, to recall disagreeable memories, requires courage and honesty. Infantile habits, persisting long after they have outlived their usefulness, interfere with new adaptations necessary for mental growth; behave, in fact, like a "conditioned reflex". You will remember that Pawlow showed how, when a bell was rung in a dog's hearing each time just before food was brought, in a short time the ringing of the bell alone was sufficient to produce an outpouring of gastric juice. So we humans—doctors and patients alike—all have our "bells", to the chimes of which we dance like puppets, the while we gravely pose as truly independent and responsible masters of our destiny. Realising this by self-analysis, the physician enlists the patient's co-operation in recollecting the more or less unconscious memories.

How far this is possible, even under the most favourable relationship between doctor and patient, varies greatly. Certainly, in some cases, one is amazed sometimes at once, sometimes only gradually, to receive much information previously not in the full awareness of the patient, information obviously of direct significance in the genesis of the trouble, so that the patient admits with genuine surprise the association hitherto unremarked. The mere recollection of forgotten experience itself does nothing; the essential step, as McDougall points out, "Is the linking up of these recollections with the rest of the mind, so that they are restored to their place and relation in the total system, and thereby become amenable to the control of the reason and the will". It is the acceptance and integration of the emotional experience with the personality of the patient that effect the cure.

In very many instances, special methods of exploration—free association, hypno-analysis, and psychoanalysis—are necessary to recall the hidden memories. These methods carry one beyond the general practitioner's viewpoint, though a general knowledge of the principles of psychoanalysis, even without full acceptance of its doctrines, is of inestimable value in dealing with neurotic patients.

To close, let me quote from a letter of a patient, who had suffered from distressing heart attacks for twenty years; attacks which have not recurred for two years:

"The professional advice you gave me in the summer, in connection with my so-called heart

symptoms, gave me a mental jog which has had a most wholesome effect. This idea of subconscious control has apparently a real foundation in fact for, you may be interested to know, not a sign of heart trouble have I had since I saw you. Whenever I imagine I am beginning to flutter and puff and palpitate, I remark to my soul, nervous system, ego, or whatever the thing is which controls my circulation, mental and physical, "Come out of that. Stop your nonsense; you are a relic,

a broken-down fossilized wreck of an antique habit; back to the junk-pile for you, and the thing retires, cowed and shrivelling up to my sub-cellular of consciousness, there to suffocate from lack of air."

In the preceding remarks I have made free use, in addition to the works of Freud, Jung and Stekel, of the writings of McDougall, Trotter, Rivers, Maurice Nicoll, Ernest Jones and Mitchell.

PATHOLOGY AND BACTERIOLOGY OF EMPYEMA AND ABSCCESS OF THE LUNG

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THE first point to be decided is what is included within the scope of the subjects—empyema and lung abscess? Roughly speaking it comprises suppuration within the limits set by one or other parietal pleural sac.

In the first place there are the various forms of empyema. Empyema is a term which is somewhat loosely employed. Strictly speaking from the point of view of derivation, it is simply a collection of pus in the interior of the body. It has, through use and wont, come to be restricted, in the medical sense, to a collection of pus in the pleural sac. The surgeon, however, would include collections of pus in the gall bladder. We, being medical as opposed to surgical men, may define it as pus accumulations bounded on all sides by pleura either visceral, parietal or, more often, by both, and frequently limited by inflammatory adhesions.

The types which may be distinguished are first of all the (1) *Generalised* where the accumulation is limited by the boundaries of the normal pleural sac. (2) *Localised* when the pus is shut in by adhesions. The infection in these cases may come (a) by continuity from the lung itself, from a pneumonia, a septic infarct abscess or other inflammatory focus. Sometimes it is apparently an almost purely interstitial inflammation. The condition starts at the root of the lung and spreading by the perivascular lymphchannels early reaches the pleura with little alveolar involvement.

(b) By continuity from the pericardial sac, the mediastinum, the œsophagus in cancer and simple ulcer (I have seen two cases of simple, peptic ulcer of the œsophagus, both ruptured into the left pleural sac with the formation of a pyo-pneumo-thorax) the ribs, peritoneum, liver, spleen or other contiguous organ or part (c) through a penetrating wound produced by needle, metal weapon, missile or by a fractured rib with or without injury to the lungs (d) by the blood stream in cases of septicæmia or pyæmia. In the case of the localised condition, according to the situation, one may distinguish (1) the ordinary type, limited on one side by the pleura lining the thorax wall and on the other by lung (ii) the interlobar type (iii) the diaphragmatic type bounded by lung on one side and diaphragm on the other and the (iv) pericardial type limited on one side by pericardial sac on the other by lung. These localised empyemas, especially the last three types behave very much like pulmonary abscesses, indeed, as will be emphasized later, they form the most common type of what is often, perhaps loosely, called lung abscess. It need scarcely be stated that the fluid content of the abscess wall may show all grades from slight turbidity through the sero-purulent to the purulent, from the hæmorrhagic to the purulent and may be mixed with gas thus constituting a pyo-pneumo-thorax. The path of infection in the empyema which follows lung consolidation is not always clear.

Sometimes when the pneumonic area is superficial the infection is direct. When the inflammatory focus is situated deeply, spreading probably occurs by lymph channels situated in interlobular septa and around vessels and bronchi. Gay and Rhodes have subjected this matter to experiment using a strain of streptococcus obtained from an empyema in the human subject and inoculating this into the rabbit. The pleura could be infected and empyema produced either by inoculation directly into the pleural sac or by introduction of the germ into the bronchus or lung. Infection did not occur in the reverse direction, *viz.*, from pleura to lung, suggesting the absence of lymph flow in this direction. As stated above an inflammation may be almost entirely interstitial in the lung substance and spread out into the pleura along the lymph channels.

The relation of these accumulations to their surroundings and their subsequent history depends very much upon the extent and situation. Nowadays of course in the majority of instances early diagnosis and operative treatment removes the purulent fluid and healing takes place with more or less extensive adhesions and collapse of surrounding structures. The interlobar, pericardial and diaphragmatic effusions on the other hand, being difficult to recognize and to get at by operation, not infrequently rupture into the lung substance, and become true lung abscesses, evacuating by way of a bronchus. In other words, the patient coughs up the contents of the abscess and healing results with cicatrization. Occasionally even large collections may remain unremoved without any great inconvenience to the patient, later on becoming the seat of calcareous deposit.

The term 'lung abscess' as already indicated, is often very loosely applied. The pathologist defines it as 'a suppurative inflammation involving the lung substance'. But the horizon of the pathologist is, naturally enough, limited by his post mortem experience. Conditions from which the patient does not die he is apt to pass over. From his point of view only two types exist: (1) Those arising in areas of previously diseased lung tissue, *e. g.*, following lobar or broncho-pneumonia; (2) those due to the lodgement of infective emboli. I think that all morbid anatomists will agree with me when I say that in nine cases out of ten a condition diagnosed by the clinician as pulmonary abscess proves at the post mortem examination to be something other than

is defined above. It may be a localised or an interlobular empyema or possibly a bronchiectasis or a cavity. But there is something to be said for the wider view of the clinician who would include localised empyemas. Barker in his *Monographic Medicine*, excludes the perforated interlobar empyema from the category of pulmonary abscess, yet he includes rupture of hepatic, subphrenic or retro-peritoneal abscess into lung. On the whole I am inclined to accept the wider interpretation of the term and to regard as actual or potential lung abscesses suppurative foci within the limits set by one or other parietal pleura.

We may leave then this question of definition and return to pathogenesis and classification.

Pulmonary abscess may follow:

1. In the first place—*acute lobar pneumonia*. Such abscesses are small and multiple with ragged walls. They tend to fuse together to form larger cavities and they pass by insensible gradations into gangrene. More often they follow a *broncho-pneumonia* especially that known as aspiration or deglutition pneumonia associated with a low state of vitality and following operation and wounds of the mouth and neck. This also is a small multiple abscess with ragged walls which passes on rapidly into gangrene and is, therefore, seldom met with in the abscess stage.

2. In the second place it may follow, trauma, the puncture of the exploring needle or a fractured rib, a stab or a gunshot wound. Abscesses so produced are rare. I cannot recall ever having seen one of this type.

3. Thirdly, we have abscess due to perforation from within brought about by simple ulcer or cancer of œsophagus eroding the lung or bronchus, (such rapidly goes on to gangrene), by abscess of the liver or by suppurating hydatids, by subdiaphragmatic abscess or by empyema opening into the lung substance. The last is comparatively common, frequently heals spontaneously and is rarely seen in the post mortem room.

4. Fourthly, there is the abscess which forms in relation to an inspired foreign body—a tooth or bone or some such non-absorbable substance. I have seen one such in relation to a tooth and another specimen in which the foreign material was a chicken bone. Such a condition usually rapidly goes on to gangrene.

It should be stated here that it would for present purposes be useless to draw any hard and fast line between abscess and gangrene of the lung. Any devitalised or dead area of lung

tissue such as an infarct, any raw and ragged surface communicating with a bronchus may become the seat of growth of putrefactive bacteria and pass from the consolidated state into the gangrenous. Manges (*Journ. of American Med. Assoc.*, 1915, May 8th, 1920, p. 124) mentions a breaking down necrotic gumma as a possible origin for pulmonary abscess.

5. In the fifth place we have the embolic abscess associated with a pyæmia due to, (a) middle ear disease and thrombosis in the lateral sinus; (b) phlebitis, *e. g.*, in veins of lower limbs; (c) liver abscess; (d) puerperal septicæmia; (e) ulcerative endocarditis; (f) acute osteomyelitis. In my experience the first is the commonest cause of this type of lung abscess. Indeed it is the usual termination of this type of case. An infective embolus from the softening clot in the lateral sinus is strained out from the blood in its passage through the lungs and an acute inflammatory focus is set up (embolic pneumonia) which rapidly softens and develops into an abscess. Such abscesses are small, numerous and irregularly scattered through both lungs. They are seldom diagnosed clinically as abscesses and their importance is merely scientific as the patient inevitably dies of the causal pyæmia. They may be associated with septic infarcts and frequently go on to gangrene.

6. Lastly we have as possible abscesses bronchiectatic or tuberculous cavities. Such are not classified in this way. Alexander James in his book on pleurisy mentions dilated bronchi amongst the causes of abscess of the lung. There is no real reason why either should not be so regarded when the limiting bronchial wall disappears. One type of multiple dilated bronchus or bronchiole known as 'honeycomb lung' is occasionally seen. It occurs in children and follows broncho-pneumonia. It is usually limited to one particular lobe and shows multiple cavities filled with pus which on suitable staining show in their walls the structure of bronchioles.

Barker (*loc. cit.*) distinguishes what he calls chronic abscess of the lung or chronic ulcerative pneumonia. This, in his own words "occurs in the course of subacute indurative pneumonia or in cirrhosis of the lung where necrosis may result from insufficient blood supply in the indurated tissue." This is a condition with which I am unfamiliar.

Before leaving the question of pulmonary abscess it may be asked, What is it which causes some organisms merely to consolidate the lung

while others soften it and break it down? Again, why may an organism at one time consolidate and at another time liquify?

The type of organism which appears always to liquify is the staphylococcus. In pyæmias in which this is the main or only germ liquifaction occurs early. Streptococci and pneumococci on the other hand probably require to be present in very large numbers before softening occurs. In an ordinary pneumonia due to one or other of these organisms germs are only present in sufficient numbers to demonstrate in the early stages. They then progressively disappear as resolution occurs. Lord (*Journ. of Exp. Med.*, Vol. 30, 1919, p. 379), suggests that resolution in pneumonia is due to biochemical changes in the course of which the acid death-point of the pneumococci is reached. In cases where softening and abscess formation occurs a secondary marked increase in numbers takes place. The determining factors are always two (1) the virulence of the germ (2) the resistance of the individual. Probably it is the latter factor which is the important one in most instances.

Where putrefactive germs gain access to devitalised or dead areas liquifaction takes place early and rapidly. This inevitably results in gangrene. The nature of the germs concerned will be dealt with later.

Bacteriology

For the purpose of the present discussion we may consider the matter under the headings of the various germs rather than under that of the lesions produced.

In empyema the common primary organisms are pneumococci and streptococci. In military cases during the recent severe influenza epidemic streptococci were found much more frequently than pneumococci (J. E. Gordon, *Journ. Infect. Diseases*, Vol. 26, No. 1, p. 29, 1920). These streptococci were hæmolytic in type. Gordon found, however, that in the chronic cases the hæmolytic streptococci tended to be replaced by staphylococci, *B. proteus*, diphtheroid bacilli and more especially a gram-negative bacillus of the Friedländer group.

This preponderance of streptococci is probably due to the peculiar type of epidemic. In normal times pneumococci play a much more important role. All the various types have been found in cases of empyema. Sometimes (J. E. Gordon, *loc. cit.*) the germ found in the lung has been a pneumococcus and the organism discov-

ered in the empyema a streptococcus. Not infrequently in the cases following pneumonia the pus has been found sterile due to the fact that the causal germ has died out.

Other organisms isolated from cases of empyema are: *B. paratyphosus* A. & B. *Meningococcus*, *streptothrix actinomyces*. These are more or less 'fancy' germs. Organisms more often met with either alone or in association with pneumococci and streptococci are *B. pyo-cyaneus* and *B. influenzae*. In cases due to infection from the abdomen and from the oesophagus a large number of germs of intestinal origin, some of them gas producers and spore bearers, are found. In one or two cases the true diphtheria bacillus has been isolated.

In lung abscess the type of germ met with depends upon the origin of the condition. Following lobar or broncho-pneumonia pneumococci and streptococci are again most common although *B. influenzae* has been found. In the embolic type staphylococci and streptococci are com-

monest but sometimes mixed infection occurs. Usually, however, even if the primary condition—middle ear disease, osteomyelitis, puerperal infection—is a mixed one, a straining out of adventitious germs occurs and the lung abscess is a pure staphylococcus or streptococcus infection.

In the type due to penetrating wounds a large number of organisms occur. Gas gangrene germs are not infrequently met with both in empyemas and lung abscess. Whenever gangrene is super-added on a softening process germs of this type tend to occur often along with *B. proteus* and other putrefactive organisms. Buday (*Ziegler's Beitrage*, 1910, Vol. 48, p. 70) was one of the first to point out the association of the combination of spirilla and *B. fusiformis* in gangrenous conditions of the lung. Quite a number of these cases of spirochaetal organisms in sputum from lung cavities have been described.

In bronchiectasis and tubercle cavities a vast number of organisms are present amongst which streptococci and pneumococci constantly occur.

THE VALUE OF COLOSTRUM TO THE NEWBORN*

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THE transmission of a degree of immunity from parent to offspring has long been recognized clinically, by the resistance of infants to certain diseases, and experimentally by biologic tests on the infant's blood. Ehrlich¹, in 1892, proved the specific immunity of the offspring to be in the nature of a passive immunity, and not inherited in the otogenetic sense. His experiments were later confirmed by numerous investigators. The immunity must then be conferred to the infant by the passage of antibodies from the mother's blood through the placenta or through the mammary gland.

In 1912, Famulener² reported a series of experiments on the passage of specific hemolysins from goats to their progeny. He considered the colostrum as the important means of transmission, as he found that it contained large

amounts of the specific hemolysin, and the serum of kids receiving it possessed a high degree of hemolysing power, while the serum of those deprived of it was only weakly hemolytic. In goats immunized during gestation, the early secretion of the mammary glands was rich in specific hemolysins. This hemolytic power rapidly fell until by the time milk was secreted it was practically negligible. He also noted that the power of producing antibodies in the newborn was weak.

Chemically, colostrum differs from milk in the quantity and quality of its proteins and its higher salt content. Globulin is found in milk only in traces, up to .03 per cent., but forms a good proportion of the 13-14 per cent. of coagulable protein in colostrum. Crowther and Raistrick⁵ examined the fluid obtained from two milkings a day after parturition, and noted a rapid fall in the total nitrogen, and particularly in the globulin within the first forty-eight hours.

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Biological tests show lacto-globulin to be identical with the serum globulin, while lactalbumin is a distinct protein.

Howe³ of the Rockefeller Institute, recently reported some observations on the nitrogen partition in the serum of calves, before and after the ingestion of colostrum. He found a much more rapid rise in the globulin, particularly the englobulin content of the serum after the ingestion of colostrum, than when the animal received no colostrum. The close association of antibodies with globulins makes these findings significant.

We repeated Howe's experiments on newborn infants. Umbilical blood was taken at birth, and venous blood at varying intervals after and the nitrogen partition in the serum determined. Three infants of the series received no colostrum. The others all received colostrum at regular intervals, starting six hours after birth.

TABLE I.
SERUM FROM UMBILICAL BLOOD

	Total N.	N.P.N.	Glob.	Alb.	Eug.	Pseudo glob. I	Pseudo glob. II
1.....	.670	.029	.270	.430	.000	.121	.080
2.....	.760	.035	.269	.473	.006	.110	.098
3.....	.928	.038	.459	.439	.000	.230	.228
4.....	.749	.028	.400	.320	.003	.214	.183
5.....	.689	.031	.450	.208	.002	.255	.189
6.....	.743	.029	.314	.400	.000	.204	.100
7.....	.830	.030	.389	.401	.000	.280	.107
8.....	.800	.025	.325	.450	.003	.200	.122
9.....	.732	.030	.230	.472	.001	.130	.100
10.....	.918	.035	.310	.573	.002	.200	.108

TABLE II.
SERUM FROM INFANTS WHICH RECEIVED COLOSTRUM
FROM SIX HOURS AFTER BIRTH

	Total N	N.P.N.	Glob.	Alb.	Eug.	Pseudo glob. I	Pseudo glob. II
24 h.....	.780	.027	.415	.338	.045	.200	.170
(4)							
48 h.....	.710	.032	.500	.278	.200	.260	.140
(5)							
96 h.....	.800	.035	.410	.308	.008	.263	.131
(3)							
(7).....	.910	.028	.498	.394	.109	.200	.189
5 days							
(1).....	.710	.030	.371	.309	.090	.138	.140
(6).....	.834	.030	.428	.375	.098	.230	.100
(2).....	.803	.034	.360	.409	.100	.145	.115

Number in brackets refers to number of case in Table I

TABLE III.

SERUM OF INFANTS RECEIVING NO COLOSTRUM

	Total N	N.P.N.	Alb.	Glob.	Eug.	Pseudo glob. I	Pseudo glob. II
48 h.....	.750	.031	.400	.350	.009	.240	.101
(9)							
5 days...	.850	.027	.423	.400	.009	.211	.180
(8)							
6 days...	.920	.035	.485	.400	.018	.200	.180
(10)							

Number in brackets refers to number of case in Table I.

The tables indicate the nitrogen partition in the infant's serum. The globulin consists of two portions, englobulin and pseudoglobulin. The latter globulin apparently contains two globulins, designated in the table as pseudoglobulin I and pseudoglobulin II, which are completely precipitated by concentrations of sodium sulphate at approximately 17.4 and 21-22 per cent. respectively.

SUMMARY

1. The blood of the newborn before ingestion of any food, contains relatively small quantities of globulin and negligible amounts of euglobulin.
2. In infants receiving colostrum within a few hours after birth, there is a marked and early rise in the englobulin and pseudo globulin, and an increase in the proportion of total globulin.
3. In infants deprived of colostrum, the globulin content of the serum remains low, and euglobulin is only present in traces.

Since the above work was begun, a report of similar observations in a few cases has appeared in the *Journal of the American Medical Association*, by Lewis and Wells. *J.A.M.A.*, Vol. 78, 12-863.

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A REPORT OF A MEDICAL SURVEY IN THE WABASKA DISTRICT

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IN making a medical survey of the Wabaska

District, we left Athabaska on May 22nd, and reached Stony Point, which is about six miles from Wabaska itself, on June 1st. In making our way from one part of the District to another, we paddled, in all, about two hundred miles; from Athabaska to Sandy Lake was a hundred miles by wagon, and from Wabaska to Sawridge was ninety miles by pack horse. In many places the roads were little better than blazed trails through the muskeg: at one point, at Rock Island Lake, the streams were in flood, and a bridge had to be constructed before we could get our horses across.

The three principal places visited by us were (1) Calling Lake, the centre of a district fifty miles in diameter, with, roughly, one hundred and fifty inhabitants; here we vaccinated 43 persons; (2) Sandy Lake, where we vaccinated 21 treaty Indians; and (3) Stony Point, where, at the Roman Catholic Mission, we vaccinated 125 half-breeds, and 61 treaty Indians.

During the trip we vaccinated in all 462 persons. Practically all our vaccinations were successful. Small-pox is common among the natives and half-breeds: there is also much tuberculosis amongst them; and many are infected with venereal disease.

Of the fifty-nine children attending the Roman Catholic Schools at Stony Point, fourteen were half-breed, and forty-five were Indian; we found in twelve of these signs of hereditary syphilis, nineteen had symptoms of tuberculosis. The chief trouble with the people throughout all this district is laziness. The children are allowed to do what they like at all times. There is no discipline: only girls are made to do any work. The result is that when the boys reach manhood they refuse to work except under compulsion and live with their parents, often when they marry bringing their wives back to their parents' small tepee to crowd it still more. An other cause of trouble is a propensity for gambling, and an absolute inability to value money. Added to this is a love for any kind of spirituous liquor, many forms of which they make for themselves by using prunes, raisins,

potatoes and sometimes flour and wheat. These are boiled and some yeast added and the whole set aside to ripen. It never gets a chance to ripen for more than two weeks.

The need of all this district is efficient police officers. The people are potentially cowards and if a policeman showed any determination whatever he could have them in complete control in forty-eight hours. The natives should be given a revised Health Act requiring that not more than one family should live in any one-roomed house or tepee, and that when young men marry, they should provide a house of their own, and if the officer were urged to see that these clauses were carried out, and if further he should be given liberty to go ahead and do whatever he thought right, and necessary, with the assurance that his judgment would be backed by the Province, then he might be able to do much to correct the conditions now existing. As it is now, as many individuals as can crowd in and live together, whether they be related or not, occupy one tepee, with the result that there is a very imperfect code of morality among them. Many of the young girls of fifteen and sixteen are mothers without husbands, many husbands are living with other men's wives. Most of the men admit having had the "sickness," (venereal) but have been "cured" by Indian medicine. In consequence venereal diseases are spreading rapidly. The death rate among children must be more than fifty per cent. Another generation will likely see few left; two generations will see them all gone.

During the summer tuberculosis lessens as they live outdoors day and night. In the winter many succumb to this disease. An interesting custom among them is that as soon as an individual gets sick he wraps himself in a blanket, and goes to call on his friends, sleeping wherever he can find room, and giving the disease every chance to spread. Under these conditions it is hard to maintain any adequate quarantine, but with the assistance of the priests, I was able to keep all the smallpox cases together on North Lake Wabiskaw.

Another interesting custom is the method of

handling maternity cases. The expectant mother hangs over a pole tied at such a height that her knees barely touch the ground, the pole passing beneath the arm-pits. In this position she remains for three or four hours till the child is expelled. Then the midwife present ties the cord and wraps the babe in a moss bag. There the child remains day and night, tied so that it cannot move hand or foot until it is old enough to learn to walk. It is nursed whenever it cries, and is removed once or twice a day and given a dry rub, never a bath. Its cradle is a crude hammock made by swinging a blanket on two ropes from the tent poles, or from the ceiling of the shack. Even at two and three years of age children are put to breast when they cry or are frightened. They are never punished and never washed.

The people of that district need someone to manage them who will enter into their living tents and order their lives for them, someone whom they are forced to obey. Little or nothing can be done for the old folks, except to make them live along sanitary lines, but the children might be helped by being taught discipline.

The question of rations as supplied by the Indian Department, requires careful consideration by the Government. The giving of rations in my opinion is doing more to degrade the Indians than any other cause. It is proper that they be kept from starving at times when there is no fur and no game, but it is not desirable that the food be given free of cost and without work. They are able to work and should be made to work out the value of every bit of food they receive. This could be managed in several ways. The best way would be to make them do road work, clearing the trails and putting down corduroy. For this work the R.M.P. would likely be better than the A.P.P., as the Indians come under the Federal Government. Another way would be to make them do garden work or even to make moccasins out of skin supplied. In this way their sense of moral responsibility instead of being obliterated by false charity might be stimulated to new growth.

Certainly if they knew that they had to work for rations, they would come less often for them. Not a few gamble with their rations; others trade them for prunes and raisins and the other articles necessary for making spirituous drinks. Some come in with a good catch of fur, spend the proceeds in silks and satins, and then ask for rations because they have nothing to eat. The giving of food at such times is not justice but a definite wrong and is causing a very rapid degeneration mentally, morally and physically. They need a manager who will make them work, as much as they need medical aid.

The white people at Calling Lake are anxious for a hospital. There is a definite need for one. In answering their requests I told them to write to the Department of Public Health offering to get out the necessary logs and put up the buildings, if the Department would supply a nurse and equipment. I made no promise that such an offer would be accepted.

SUMMARY OF CASES TREATED

Smallpox	72
Syphilis,	
Primary	23
Hereditary	18
Tuberculosis,	
Pulmonary	38
Hip	3
Glands of neck	4
Elbow	1
Cancer	
Of Bladder	1
Of Breast	1
Of Uterus	1
Chronic Mastitis	1
Duodenal Ulcer	1
Salpingitis	1
Bad teeth	Most of them
Heart trouble	2
Unclean sores	1
Mumps	2
Chickenpox	4
Rodent Ulcer	2
Axe cut	1
Knife cut	1
Broken arm	1
Perfectly normal	9

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Almost everyone whom I observed while vaccinating appeared to have pulmonary tuberculosis. Many of the children had Hutchinson teeth, and nearly all had very bad teeth.

ROENTGEN RAY DIAGNOSIS OF TUBERCULOSIS OF THE BONES AND JOINTS

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THE object of this paper is not to give a complete exposition on the subject of tuberculosis in bones and joints, but rather to give a short synopsis of the distinctive features which may be regarded as typical of tuberculosis in bones and joints, and to demonstrate these features by means of lantern slides.

Although in many cases the actual diagnosis of tuberculous arthritis can be made without the X-Ray, and in some instances it can be made earlier by clinical methods than it can by the radiogram, yet there is no other method of examination by which the exact location, the extent, and the intensity of the morbid process can be so definitely determined. On the other hand the X-Ray diagnosis often plays a decisive part in cases where the clinical picture would seem to indicate tuberculosis, but by the X-Ray examination the non-tubercular nature of the lesion can be established.

In our interpretation of all X-Ray plates we need to keep clearly in mind that what we see on the plate are shadows, and that these shadows depend entirely on the varying densities of the substances interposed between the X-Ray and the plate. In order that we may correctly interpret these shadows, it is very essential that we know the normal appearance, so that very frequently in examining the suspected bone or joint it is advisable to take the corresponding bone or joint of the opposite limb for comparison.

In order that a tuberculous or any other pathological lesion may be seen on the plate, it is essential that a visible change has taken place in the density of the tissues. As the shadow produced on the plate by bone is due practically entirely to the mineral content, so it follows that the only two possible changes in bone that will give different shadows are, either an increase or a decrease of this mineral content. If this change has not taken place, we cannot expect to find any evidence of bone pathology on the plate.

This is frequently the case in early tuberculosis, so that the clinical symptoms may be quite

positive, and yet radiographically there is no change to be noted. This is also the case in acute osteomyelitis; the clinical symptoms will be typical, the surgeon on operating will find the medulla and the haversian canals full of pus, and yet no change is to be seen on the plate, simply because at that stage there has been no bone destruction or absorption of the mineral content of the bone. A plate taken a few days later in the case of osteomyelitis, or a few weeks later in the case of tuberculosis, will probably show the typical diagnostic appearance. From these considerations it will be seen that although a positive finding is of the utmost importance, yet a negative finding must be interpreted with the utmost caution, since many early pathological processes are lacking in the physical properties which are essential for reproduction on the plate.

Let us now consider the distinctive features as demonstrated on the plate, features which should guide our judgment in the making of a diagnosis of tuberculous infection of the bones or joints.

The normal joint consists of the capsule and ligaments, the articulating surface covered with cartilage, and the whole lined with synovial membrane. As there is no free bone or periosteum in the joint, we shall have to consider first the changes that take place in the other structures.

First of all, in the case of tuberculous arthritis, there is to be noted a haziness of the joint as if a very poor plate had been taken, but the bone a short distance from the joint will be sharp and clear, thus showing that the trouble is in the joint itself. This haziness is due to the condensation and thickening of the capsule and synovial membrane, with some fluid formation.

The next stage is the gradual destruction of the articulating cartilage, and although the cartilage is not to be seen on the plate, we can infer this destruction by the fact that the joint space is narrower than in the normal. The cartilage having been destroyed, the disease erodes the

underlying bone, and it becomes irregular with somewhat of a scalloped effect.

Owing to the pain in the joint upon movement, the joint is fixed, and as a result we get atrophy of the ends of the bones around the joint an atrophy which increases with the duration of the disease.

This atrophy is characterized by a uniform thinning of the cancellous tissues, the cortex remaining sharply defined and clear cut. The atrophy is due to disuse of the bones and muscles, and will take place around any joint that is placed at rest for any considerable time.

The joint being placed at rest by nature or by mechanical means, the disease subsides and regeneration takes place. As cartilage once destroyed does not tend to reform, the only substances by which it can be replaced are fibrous tissue or bone, and in the case of tuberculous arthritis it is replaced by fibrous tissue. In fact one of the characteristic features of tuberculosis of joints or bones is, that during the progress of the disease there is no new bone formation, and even during regression bone regeneration is very limited, so that ankylosis is mostly fibrous in nature. In the case where a tuberculous abscess has been opened, it frequently becomes infected by other germs, and there may be a large amount of new bone formation, but in an uncomplicated tuberculous joint, there would be little, if any, new bone formation.

We will next consider tuberculosis in bone. The focus is nearly always in or close to the epiphysis. The first bone change to be noted on the plate will likely be, a round translucent area about the size of a pea, with the surround-

ing cancellous tissue well preserved save for a narrow turbid zone around the necrotic area. The focus has the appearance of being cut out of the bone.

As the disease progresses, this area extends towards the end of the bone, until the articulating cartilage is reached and eroded, and then all the symptoms of a tuberculous arthritis are set up.

The distinctive features of tuberculosis of bones and joints may be summed up as follows:—

(A). JOINT TUBERCULOSIS

- 1.—A uniform thinning of the cancellous tissue—atrophy.
- 2.—A well defined cortex.
- 3.—Condensation and broadening of the capsule.
- 4.—Cartilage destroyed or reduced in depth.
- 5.—Erosion of the articulating surfaces of the bone.
- 6.—No new bone formation.

(B). BONE TUBERCULOSIS

- 1.—A local bone focus usually in the epiphysis.
 - 2.—A round outline of focus.
 - 3.—Not extended along the shaft.
 - 4.—Purely a destructive character—no bone regeneration.
 - 5.—Extends to and involves the joint.
- Any one of these signs in itself does not, as a rule, constitute a positive diagnosis of tuberculosis, but taken together and compared with the symptoms presented by other forms of bone diseases, they will usually give a decisive finding.

The Sex Incidence of Appendicitis.—Backman (*Acta Medica Scandinavica*, April 22nd, 1922) has investigated the sex incidence of 933 consecutive cases of appendicitis operated on in the period 1909–15. He found that the males were represented by 335, the females by 598 cases, the percentages being 35.9 and 64.1 respectively. Classifying his cases according as the disease was simply catarrhal or destructive at the time of operation the author found that in the catarrhal class there were only 194 males to 465 females, whereas in the destructive class the numbers were approximately equal (141

males to 133 females). Discussing the comparative frequency of simple catarrhal appendicitis in females the author notes that in this class 50 per cent. of the females suffered from chronic constipation, whereas this was the case only in 24 per cent. of the males, and he suggests that chronic constipation is largely responsible for the genesis of catarrhal appendicitis in women. Catarrhal appendicitis terminates in destructive appendicitis more frequently in the male than in the female because the appendix of the male has a single, not a double, blood supply.—*Brit. Med. Jour.*, Aug. 22nd, 1922.

POISONING FROM THE EXTERNAL USE OF RESORCIN*

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RESORCIN was employed about thirty years ago as an internal remedy for its supposed antiseptic effect in different intestinal disturbances in children. A number of instances of poisoning followed its use, so that its employment in later years as an intestinal disinfectant was discontinued. For many years, however, resorcin has been used extensively in the local treatment of various skin affections, and it has been generally considered that no danger accompanied this use of the drug. Recently, two cases which showed signs of poisoning after the external use of resorcin were encountered in this clinic.

Report of Cases

Case 1.—Baby A. H., 6 weeks of age, was admitted to the infant ward on June 3 1921, with a severe eczema of three weeks duration. The infant was breast-fed for first two weeks, and then fed on a modified whole milk mixture. Examination showed a well developed and well nourished baby; weight eight pounds. The skin on the head and face was covered with a dried sero-purulent exudate. On the trunk and extremities the eruption was very red and moist, patchy in distribution, but becoming confluent in such areas as the neck, elbows and buttocks. For the first four days after admission starch poultices were applied. On June 7th an ointment containing approximately 8 per cent. resorcin was applied to practically the entire skin surface three times during the day. On June 8th the treatment was applied as usual in the morning and again at 2 p.m. About 3 p.m. the infant "collapsed." The skin which had previously been a bright red became pale and ashen-colored. The eyes appeared sunken and were rolled upwards. Mustard baths and stimulants were given freely to combat these symptoms. At 6 p.m. the ointment was again applied. The baby was

now comatose. The respirations were slow and shallow. The pulse was weak and thready. At 3 p.m. on June 9th she had a convulsion lasting 10 to 15 minutes. Further treatment with the ointment was discontinued, and at 9 a.m. 240 cubic centimetres of blood were withdrawn from the long sinus, while 300 cubic centimetres of the mother's blood were injected into one of the small veins of the leg. This caused a most marked improvement in the infant's condition. The respiration and pulse steadily improved and the ashen-grey color of the skin disappeared. Twenty-four hours later she had quite recovered and showed no further symptoms of collapse. The resorcin ointment was not again applied, but olive oil containing 4 per cent. resorcin was applied to scalp only, with no untoward symptoms.

Case 2.—Baby W. C., 2 months old, was admitted to the infant ward on September 29, 1921, with an eczema of six weeks duration. Until three weeks of age baby was breast-fed, then for the following three weeks alternate breast and bottle feedings were given. Later she was fed entirely on a modified cow's milk mixture with a moderate amount of carbohydrate added. Examination showed a well developed but undernourished infant; 8½ lbs. in weight. On admission she was suffering from a mild upper respiratory infection. The eruption was most marked on the head, neck and buttocks, but was also present on the trunk in many isolated areas. Very few "crusts" were present. The affected surface was constantly moist and bright red in color. For four days following admission, a starch powder containing 1 per cent. calomel was applied with little or no improvement. Beginning October 4th, an ointment which contained 4 per cent. resorcin was applied to the involved areas night and morning. This treatment was continued for 3 days. On October 7th, the ointment was applied as usual in the morning. About 10 a.m. the baby "collapsed." The skin was ashen-grey in color. Respirations were slowed and somewhat shallow

*From the wards of The Hospital for Sick Children, Toronto, Ontario.

The temperature was maintained by means of hot water bottles and stimulants were given freely. At 12 o'clock the infant was comatose. The eyeballs were rolled upwards and the pulse was weak. The baby was then given 100 cubic centimetres of blood from the mother. During the next few hours the condition seemed to be improving gradually, and in twelve hours the baby's condition was again satisfactory. The ointment had been removed at the onset of the symptoms and was not again applied.

On October 18th, the rash appeared to have improved but slightly. Keeping in mind the absorption of poisonous amounts of resorcin, it was decided to try again its application to the eruption. Accordingly, in the morning, olive oil containing 4 per cent. resorcin was applied freely to the broken surface. On the same afternoon the nurse reported that the baby was not looking so well. Examination showed an ashen-grey color of the skin which had not previously been present. The baby was very quiet and listless and the eyeballs were rolled upwards. The resorcin was discontinued, and on the next day there was no suggestion of any of these signs.

A specimen of urine was obtained previous to this application of the resorcin, and also another after the symptoms of collapse appeared. The total phenols, which include resorcin, were then determined in both specimens by a method described by one of us¹. A marked increase was found in the quantity of phenol present in the second specimen, and when a portion of this urine was exposed to the air for some time, it became quite black in color.

A search of the literature reveals five cases of resorcin poisoning, following the external use of this drug. Symptoms similar to those encountered in the two cases here reported were present in nearly every instance. The following is a brief account of these five cases.

Case 1.—Reported by Kaiser². Male, age 29 years. Admitted with psoriasis. 100 grams of a 50 per cent. resorcin paste were applied. Shortly after this the patient complained of a burning sensation over the area of application. He began to sweat profusely and the house physician was called. Although the paste was removed about three-quarters of an hour after its application, the patient became unconscious a few minutes later. His pupils were dilated, the pulse was weak and very rapid and the breathing shallow and rapid. At times the whole body became spastic. The patient regained consciousness in about an hour and

was given strong coffee and diuretin. About three and a half hours after the application of the paste, greenish colored urine was passed. In this the presence of phenols was demonstrated. In the course of three or four days the patient completely recovered.

Case 2.—Reported by Nothen³. Male, age 19 years. Admitted with eczema. 220 grams of a 9 per cent resorcin paste were given by inunction. Almost immediately the patient complained of vertigo and soon lost consciousness. Cyanosis rapidly supervened and the skin became cold and covered with perspiration. The pupils were contracted and fixed; the pulse was rapid and the respiration both rapid and shallow. The ointment was quickly removed and venesection performed. An injection of camphor was given. About four hours after application of the paste the patient regained consciousness for a few moments, then fell into a deep sleep. The next morning he was much improved and in a few days completely recovered.

Case 3.—Reported by Nothen³. Infant 11 days old. Admitted with phemphigus neonatorum involving the skin of the head, chest and arms. A 3 per cent. resorcin paste was applied. In about two hours the nurse found the child dead.

Case 4.—Reported by Boeck⁴. Male, age 16 years. Admitted with lupus vulgaris. A 25 per cent. resorcin paste was applied to the left calf on which the skin was almost entirely intact. One and a half hours later patient was found unconscious. He had slight twitchings of the right arm which soon involved the whole body. He was markedly cyanosed and the skin covered with perspiration. The respirations were frequent, and the pulse rate increased to 150 per minute. A venesection was performed and camphor injected with no apparent beneficial effect. The pupils were at first dilated, later contracted. The patient died without regaining consciousness about ten hours after the application of the ointment.

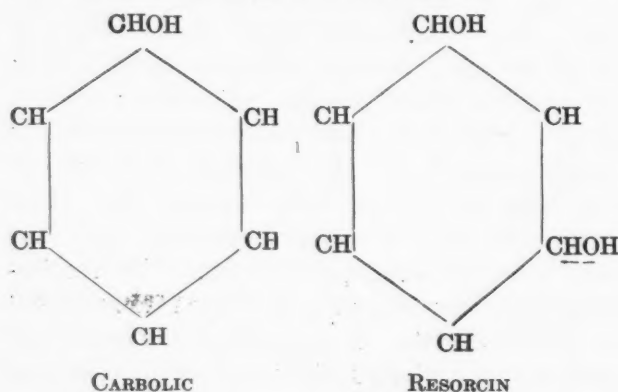
Case 5.—Reported by Kyrle⁵. Male, age 2 years, was treated for "Herpes tonsurans maculosus" with a 10 per cent resorcin solution. Dressings moistened with the solution were twice applied to both thighs in the course of an evening. The skin over this area on which the dressings were applied was almost intact. The next morning the boy became unconscious, with marked cyanosis. The skin was covered with perspiration. The respirations were frequent and

superficial and the pulse weak and irregular. The pupils were dilated. Slight convulsions appeared, chiefly of the face and upper extremities. Heat was applied to the whole body and injections of camphor were given. The condition gradually improved, and the following day the child was almost completely recovered. Greenish colored urine was passed.

DISCUSSION

It is well known that patients suffering from infantile eczema frequently collapse and die. No adequate reason has been advanced to explain the occurrence. The possibility of such a condition existing in the two cases reported above must be considered. However, in both instances the collapse occurred after the application of resorcin paste. In one case the symptoms disappeared after the removal of the ointment only to recur when it was again applied some days later. It should also be noted that in these cases the skin area to which the resorcin was applied was not only extensive but presented a raw and bleeding surface which, of course, was most suitable for the rapid absorption of the drug.

Resorcin belongs to the phenolic group of substances and is closely related to carbolic acid as the following formulæ show:



Its action is somewhat similar to that of carbolic acid, but it is less irritant and less poisonous. Members of this group of substances when absorbed by the body are conjugated, largely in the liver, with sulphuric or glucuronic acid to form non-toxic esters which are then excreted by the kidneys.

A consideration of the mode of action of resorcin in these cases is of interest. Three theories are suggested:

1. A very rapid absorption from the skin of an overwhelming amount of the drug.
2. A moderate absorption with the failure of the liver to convert this into a non-toxic substance.

3. An increased sensitiveness or idiosyncrasy of certain cases to the drug itself.

In our two cases the ointment was applied to extensive raw areas from which the drug could be absorbed with great rapidity. On the other hand, in some of the cases reported the poisoning occurred after the application of resorcin to relatively small areas of practically intact skin. In these cases it is not unreasonable to assume that the patients either had a marked idiosyncrasy to the drug, or else when absorbed it was not detoxicated in the usual manner. A case of unusual sensitiveness to resorcin has been reported by Montgomery⁶. In this instance the application of resorcin to the skin resulted in a severe dermatitis. This local reaction could not be due to a failure of the liver to render the drug non-toxic after its absorption, but must have been due to an idiosyncrasy to the drug itself.

Numerous cases are on record in which considerable absorption of resorcin occurred after the internal use of the drug, but no symptoms of poisoning appeared, probably because the body rendered the substance non-toxic shortly after its absorption. In these cases large quantities of resorcin were actually absorbed because the urines excreted were greenish in color, and when exposed to the air soon turned black.

From the information available it is evident that there are many points in favor of each of the three theories advanced, and it is difficult to state which factor is the most important one. No doubt it varies in different cases.

The object of this paper is not to detract from the very excellent results which are obtained in many skin conditions by the use of resorcin, but to direct attention to the fact that in certain unusual cases symptoms of poisoning may result from the external use of this drug.

The authors desire to acknowledge their thanks to Dr. Alan Brown, Physician-in-Chief, for permission to report these cases.

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WHEN TO OPERATE ON RENAL CALCULUS*

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ON the day I decided on the subject for this paper I had just read the following:

"On the whole, any stone in the kidney or ureter is surgical without exception, when the patient is under seventy years of age. This is with or without the presence of symptoms."¹ A few days previously I had also read this: "We should conserve the kidney, and while it may be conservative to leave certain stones in, my conservative policy is to take them out wherever they are."²

If the treatment of a disease exhibiting such wealth of clinical variety as renal calculus can be adequately covered by accepting the dictum that every stone should be removed on sight; then, indeed, would a very great burden be lifted from the shoulders of those who have been honestly trying to weigh the evidence presented by each case and treat it upon its own individual merits. It becomes merely a straight open and shut proposition, which if good for the patient is certainly best for the surgeon, relieving him as it does, at once, both of the necessity for further exercise of that surgical diagnostic acumen he may possess, as well as all responsibility in regard to the ultimate result.

To begin with, many stones are passed spontaneously, sometimes it is true, with considerable inconvenience to the patient, but nevertheless passed, and statistics, if available, would show the number of such to exceed by many times the number of those retained. This happy termination to a more or less trying ordeal should in some degree be a matter for self congratulation to the individual most interested, since it establishes the fact that the urinary passage is free of definite obstruction, and gives reasonable grounds to hope for a similar conclusion in the event of a recurrence. E. L. Keyes, New York³, states, "That his records fail to show a case, where a kidney that has passed its first stone successfully, failed to pass the subsequent

ones as well." But his experience in this differs from that of some of us.

While stone, of itself undoubtedly causes some damage to the kidney, it cannot be denied that in the majority of instances the bulk of the trouble is due to a concurrent infection, and that while the stone must be considered a constant menace to the health of the individual, it is often tolerated during many years of comfortable life with apparent impunity. Its discovery, therefore, in the course of routine examination, or suggested by some slight grumbling discomfort, does not constitute an emergency necessitating immediate operation; but rather may be viewed with a measure of complacency while being kept under observation. There is frequently no data by which we can estimate its probable duration. It may have existed for several years, and might possibly remain for several more without material increase in size or discomfort to the patient. It should be x-rayed at least once every six months, and so long as it remains silent and of a size that might pass spontaneously should not be interfered with. A. D. Bevan, Chicago⁴, "Shall we immediately operate on these cases? Certainly not! Each one of these cases must be analysed separately as an individual problem. Where we find a single stone in the pelvis of one kidney and the patient is a good surgical risk, if that stone is one half inch or more in diameter, the clear indication is a surgical operation and the removal of the stone through a pyelotomy." A stone over one centimeter in diameter is usually too large to pass, and if found to be on the increase should be removed before it reaches such calibre as to cause extensive damage to the kidney. Likewise, if a smaller stone suddenly begins to give tongue and cannot be quieted by simple means, it is better to operate early than to persist in palliative treatment at the risk of permanent injury from chronic or intermittent obstruction and the possibility of coincident infection. The mutilation caused by the search for a small stone in the renal parenchyma will

*Read before the Canadian Medical Association at Winnipeg, Man., June 22nd, 1922.

frequently do more damage than the presence and growth of the stone over a period of years. These, like the pelvic stone, are better left until they have reached a fair size, when they will be more easily located, just as easily removed, and with relatively less trauma. Stone in the kidney is one thing, but stone + infection, or + obstruction, or + both, is an entirely different proposition. Broadly speaking, either or both of these complications constitutes an absolute indication for surgical intervention. But a dozen pus cells in the urine need not be regarded as ominous; nor an occasional period of discomfort picture to our minds a hydronephrosis; or both together a pyonephrosis; and while I have not the slightest desire to appear to treat a serious condition in a contemptuous or off-hand manner, it is, nevertheless, frequently astounding how well such infections are tolerated and how readily they clear up when the aggravating cause is removed.

Mrs. S. M. C., small stone and abundant pus in right kidney for over two years, operation refused. Last summer, stone half inch in diameter, with abundant pus and definite albumin ring in urine. Played golf all season. Gained twenty pounds. Was runner up for provincial championship. Operation this spring by Dr. N. J. McLean. The stone was removed by pyelotomy. Pus absent in six weeks. After three months, still no pus, no albumin, x-ray negative, function approximately equal and normal.

A large stone in the pelvis with or without noection, that can be dealt with by pyelotomy isguld be removed, if the patient is otherwise atood surgical risk, but any operation which in ntionally fragments a stone is to be deplored. Allarge branching calculus filling pelvis and cayces, in the presence of even a small remnant of renal function should usually not be interfered with unless causing very active symptoms. Its removal will necessitate a complete nephrotomy with concomitant damage to remaining healthy renal tissues variously estimated at about $\frac{1}{3}$ the whole kidney substance; with secondary hemorrhage, its dangers and anxieties constantly in the background. It must be remembered that many of these large stones are well tolerated and may probably carry on with more or less active function in comparative safety to the patient for many years before the distruction fo renal tissue due to the calculus reaches the equivalent of the surgical trauma necessitated

by its immediate removal; that the probability of recurrence is easily commensurate with the amount of relief usually given; and that in addition to the risk, discomfort, inconvenience and shock usual to such operations, the possibility of a nephrectomy, either primary, secondary or emergent, looms large on the surgical horizon and can neither be forgotten or ignored. Even a lame kidney is better than none, when the support of life hangs in the balance, and we have been so frequently astonished by the activities of life allowed by a relatively small remnant of functioning renal tissue, that one is inclined to deprecate an operation which instantly and permanently destroys a large fraction of possible function in pursuit of a questionable amount of relief.

Multiple calculi while less frequent than the small single stone, occupy a very prominent place in the consideration of renal lithiasis. Numerically, they may vary from 2 or 3 small stones in the pelvis to such large numbers invading the kidney substance, that any attempt at removal short of complete nephrectomy would obviously be doomed to failure. In the first condition, if the stones are too large to pass they should be removed, and if not delay may be counselled, always bearing in mind that the danger of calculus anuria with multiple small stones is greater than with the larger variety. In the second it is usually better not to interfere, always conceding that should complications supervene, such for insrance as a small stone becoming dislodged and setting up acute obstruction, that this would necessitate immediate operation for relief, but that even in this case nothing more should be undertaken than can bs accomplished by a simple pyelotomy. Between these two extremes is a wide territory where there is much room for speculation and diversity of opinion, but this much can be positively asserted. That pyelotomy in competent hands, and where necessity compels is undoubtedly the best operation for renal lithotomy. That nephrotomy with its destruction of renal tissue and other dangers incident thereto, is to be avoided whenever possible. That the presence of multiple stones may be read as indicating an alarming tendency to form such. And that embedded stones are more prone to recur than any others. Federoff⁸, Leipzig, reviewing a series of 557 operations on kidneys, states: "His experience confirms that nephrolithotomy is one of the most dangerous of operations. He

prefers to remove the kidney rather than cut into it, if a pyelotomy incision and a few small incisions in the parenchyma fail to answer the purpose and there is suppuration, and extensive atrophy of kidney tissue, or several calculi embedded in the parenchyma."

Bilateral Stone. Each and every problem presented by stone in one kidney may be duplicated in the other; indeed, it is no uncommon thing to find that the opposite side from that to which our attention has been called is the seat of extensive disease. The discovery of one stone should suggest the possibility of others, and should arouse rather than allay our suspicions that we had reached the root of the matter; therefore, no examination for stone is complete that does not cover the whole urinary tract. Bilateral stone, like multiple stone, suggests a more or less pronounced readiness to produce stone, and should actuate us toward non-interference where possible.

General rules for operation in this condition, and usually accepted, are tabulated by Keyes (3), as follows:

1. The kidney showing the better function should be operated on first.
2. The kidney showing acute symptoms is usually the sounder organ.
3. Impaction of stone in ureter of the sounder kidney may temporarily reduce its function below that of its fellow. Under such conditions it is safer to operate first on the side with the ureter stone.
4. Simultaneous bilateral operation may be attempted if the patient's condition is relatively good and the first operation not unduly long (30 mins.).
5. In an emergency, such as anuria, the sole object of operation should be to provide drainage to the kidney, usually by pyelotomy (which in the case of anuria should always be bilateral). Such stones as cannot be rapidly reached and readily removed should be dealt with at a subsequent operation.
6. Geraghy's formula, i.e., good concentration of urea, and of phenosulphonthalein, and a small quantity of urine (with consequent low total thalein) may be depended upon to indicate an atrophied or congenitally small kidney inadequate to support life.

Stone in a single kidney or the kidney that has assumed the whole burden of the renal function does not present features that differ essentially from stone under other conditions.

In fact the best we can do towards the conservation of a single kidney should also be our aim under all circumstances.

The question when to operate on renal calculus, often brings us face to face with the grave necessity of making a decision which one way or the other will seriously affect the future life and prospects of the patient, and for the making of which we have as yet no definitely established criterion on which to work; but rather only opinions of men of world renown which differ as widely as the distances from which they come. Take for instance the subject of the recurrences of stone, too large a question to be even touched on in this paper. Cabot and Crabtree⁵, Boston, publish 51% of recurrences. W. F. Brassch⁶, Rochester, states that "The percentage of recurrences of renal lithiasis should be less than 10%." Whereas Frayer⁷, of London, believes that "recurrence is so frequent that non-surgical interference is the best policy to pursue, unless decided symptoms are present." In addition to the foregoing wide divergence of opinion, our own experience has been replete with so many instances of the post operative vagaries of calculus disease that we shrink from advising active measures in cases that appear to be doing well while left alone. One sees not a few instances in which after a series of operations on one or both kidneys, a point is reached, beyond which surgical interference is not deemed advisable, although the original condition as regards stone is as bad if not worse than at the beginning, and in these there is sometimes room for conjecture as to what the present condition might have been, had it been possible to delay that first interference.

Conservatism must not, however, be carried to the opposite extreme, for nothing is to be gained, indeed, only harm can result, from an attempt to preserve a kidney which is merely serving as a pocket for pus; a breeding ground for organisms; and a factory for toxins; the very probable site of a new stone and a very serious menace to the health of the individual. Pyonephrotic kidneys can rarely come back, and should usually be moved

Undoubtedly the majority of retained renal calculi sooner or later require operation for removal, and just as surely many cases of calculus pyonephrosis require nephrectomy. But, between the diagnosed presence of stone and its

attack by radical surgery, is a border land, where such considerations as the amount of systemic disturbance; the functional value of the diseased kidney; the chemical nature of the calculus; the estimated likelihood of a recurrence, in relation to the functional value or probable menace the diseased organ will be to the patient during the interim; the probable duration of the interval; all these points and many others in relation to the second kidney as well as the general condition of the patient, constitute a territory in calculus disease which can only be covered by mature consideration of the facts in relation to the probable consequences. The time has, therefore, certainly not yet arrived when any man or body of men can lay down an

absolute dictum as to when or what operation shall or shall not be done.

This survey is from the standpoint of general surgical and hospital efficiency as it actually exists, by and large, throughout the length and breadth of this great Western country.

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RADIUM THERAPY (LANTERN DEMONSTRATION)*

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DR. AIKINS preceded the presentation of the lantern slides by a general outline of the facts known regarding the value of radium in therapeutics. He laid particular emphasis on the work that had been done by radium in uterine conditions. He spoke of its value in cases of uncontrollable uterine bleeding which were of non-malignant origin. The results obtained in the treatment of such conditions warranted the use of radium as a specific in preference to any other method. In the treatment of cancer of the uterus, surgery should replace radium where the fundus was involved, but in cancer of the cervix many encouraging results had been obtained from its use. Certain surgeons had already substituted the use of radium for operative procedure in cervical cancer, and it was to be hoped that, with the further development of radium therapy, surgery in this condition would ultimately be replaced by radium. Radium was of most service in borderline cases. In inoperable cases the use of radium had been more than justified, for by it was secured a lessening of pain and discharge, and, in some instances, the foul odor accompanying the disease had been

entirely dispelled. Attention was also drawn to the value of radiation before and after operation, particularly in carcinoma of the breast. He then proceeded to discuss the technique of radium therapy. There were various methods of applying radium in order to bring it into contact with the tissue to be treated: (1) emanation tubes containing radium gas; these were buried in the tissues; (2) radium needles which also were buried in the tissues; (3) radium tubes, and (4) flat applicators. The slides which Dr. Aikins showed featured cases treated by all four methods and from these results one was justified in concluding that, to a very great extent, it was a matter of choice which type of applicator was used, as the ultimate effect was the same in most cases. However, in the experience of the speaker, skin lesions responded much more satisfactorily to the use of flat applicators than to any other type of apparatus, but tubes or needles were indispensable in the treatment of uterine conditions.

Very striking slides were shown which presented most convincing evidence of the efficacy of radium in the treatment of epithelioma, rodent ulcer, sarcoma, lupus, keloid, angioma, and other birthmarks.

*Read at the annual meeting of the Canadian Medical Association, Winnipeg, June 21, 1922.

Case Reports

RETRO-CAECAL ABSCESS RUPTURING
INTO BLADDER FOLLOWING COURSE
OF RIGHT URETER.

DRS. WEBSTER AND HOOPER

Ottawa

Girl, age 25, was referred with diagnosis of stone in kidney.

Four days before admission to hospital was seized with sudden onset of sharp severe pain right side; cramps, nausea and vomiting; pain steady and severe. A few hours after began to pass blood per urethra, high fever, pain and haematuria persisted. Had to be given morphine by hypodermic injection.

Past history negative. Always healthy, lost left eye at age of two years. Onset of menstruation age 14, every 28 days, no pain, no leucorrhoea, always regular. Last period ended two days before onset of pain.

Family history negative.

Examination: Patient looked toxic. T. 103; pulse 110; respirations 20. Heart and chest negative; tongue coated, dry; abdomen tender, rigid right side and back, mass right side. W.B. C. 14,000, 70 per cent. polymorphs. Was passing pus and blood. Kidney, ureter and bladder were x-rayed. Report as follows:—

"Kidneys negative, ureters negative; two small round shadows right side pelvic cavity, probably calcareous glands."

Cystoscopic examination made. Bladder was full of blood clots, fresh blood, foul smelling pus and mucous, even after many washings was impossible to distinguish anything. Patient was put on fluids, ice bag to abdomen, frequent bladder lavage and colon irrigation, general elimination treatment.

Gradually improved. In five days another cystoscopy was done. Bladder much better, still pus and blood. Mouths of ureters were visible; catheters passed readily to left kidney, a little difficulty in passing to right. Samples collected which were clear. Microscope, no pus no blood and sterile on culture.

Bladder lavage continued and patient markedly improved. Temperature and leukocytosis came down, but still pus in bladder.

Vaginal examination under anaesthetic revealed a normal pelvis. Specimens from each kidney again showed no pus, no blood. Catheters passed without difficulty, bladder still showed pus.

Patient was discharged from hospital in good health, except for the pus found in urine. Returned every week for examination and continued bladder lavage.



SECOND CATHETER POINTING TO RETRO-CAECAL ABSCESS

While washing out bladder with cystoscope it was noticed that pus seemed to come down from a small opening just to the right of mouth of right ureter. A catheter was gently pushed against it and it went on through. An x-ray catheter was inserted in right ureter and another up the sinus and a picture taken. Report of x-ray:—

"Two ureteral catheters in position of R. ureter to level of intercristal line. One continues on normally to level of II L. spine. Second catheter curves outward two degrees to one and a half degrees above iliac crest."

A diagnosis of a retro-caecal appendix which had ruptured into bladder along the course of ureter and thus drained itself.

Patient remained in hospital a few days, but was feeling so well, refused operation and so went home. On writing her attending physician she is reported in good health.

AN INFECTIOUS TYPE OF ERY- THEMA NODOSUM

WARD WOOLNER, M.B.,

Ayr, Ont.

Erythema nodosum is not an uncommon disease in country practice, but it is unusual for the disease to develop a well marked infectious character. In February, 1922, I was called to see a well-to-do farmer's wife, aged 35, who had always been in excellent health. I found her ill with a sore throat. Her temperature was 103°, pulse 120, while spread equally and symmetrically over both anterior tibial surfaces were about a dozen typical erythematous nodes. During the following week, similar nodes appeared over the whole anterior surfaces of both legs and arms, and a few were seen on the neck. Over two hundred typical nodes appeared in all. The patient was very ill. About a week after I had seen the mother, all the five children were taken ill with the same type of sore throat and with similar nodes on their shins. They were not so ill as the mother, nor had they more than a dozen nodes. The father was ill at the time with active pulmonary tuberculosis.

A young woman from another home was called in to help with the housework and two weeks later she developed the same disease. She was removed to her home and there a sister developed the condition within another two weeks. All recovered. This disease was probably due to a streptococcus infection finding its way into the system through the throat. The literature at hand has very little information about infectious erythemas. Symes, in 1907, in the *British Journal of Children's Diseases* reports an outbreak in a children's home in England during which thirteen cases occurred with one death.

Several writers have tried to show some connection between erythema nodosum and tuberculosis. It is interesting to note that in the first family the father had tuberculosis, but in the other family the writer could not find any trace of this disease.

ABSTRACT OF CLINICAL LECTURE ON TWO CASES OF TUBERCULO- SIS OF THE SPINE

A. MACKENZIE FORBES, M.D.,

*Orthopaedic Surgeon to Montreal General Hospital;
Surgeon in charge of the Children's
Memorial Hospital.*

A. K., number 23/22, C.M.H., was six years of age when he was brought to this hospital. The complaint made was that he had difficulty in moving his left hip in walking. His parents had been fugitives from Bolshevik Russia. During the flight out of Russia the boy had fallen from the top of a load of furniture, and hit his back. On his way to this country he had been taken to a clinic in Antwerp where a tentative diagnosis of tuberculosis of the left hip was made. Shortly after reaching Canada, his parents had brought him to the Montreal General Hospital where a diagnosis of tuberculosis of the lower vertebrae was made. He was then sent to the Children's Memorial Hospital. In the examination after admission tuberculosis of the left hip was excluded as there was no atrophy of the muscles of the thigh; the glands in both groins were enlarged; while there was some limitation of extension at the hip, there was distinct spasm of the erector spinæ group of muscles, and there was no hypertonicity of the muscles about the hip. The patient's attitude also suggested a lesion in the spine. There was distinct scoliosis with convexity towards the right in the dorso-lumbar region and towards the left in the lumbar, sacral, and cervical regions, although there was no kyphosis. On flexion the spine was noticed to bend as a whole; hyper-extension of the spine was limited; also bending to the right was limited and gave rise to pain, whereas bending to the left was not limited. On X-ray examination no lesion of any vertebra was seen.

It was not difficult, however, to localize an inflammatory lesion on the left side of the spine. There was hypertonicity of the anterior abdominal muscles; spasm of the left erector spinæ group of muscles; spasm of the left ilio-psoas muscle and enlargement of the glands in both groins. Further, the spasm in the left erector group was greater than that in the right and the glands in the left groin were more markedly enlarged than those in the right; lastly, bending to the right was distinctly limited, and seemed to cause pain, whereas bending to the left was not limited, and did not cause pain. There was.

therefore, no uncertainty as to the position of the lesion in this child. Further, it was considered to be inflammatory and probably tuberculous in nature, because a Von Pirquet test had been positive, and the child's age suggested the probability of a tuberculous lesion.

Since the x-rays were negative, and since there appeared to be a definite inflammatory and tuberculous lesion the possibility of it being centered in the left kidney was considered and ruled out. A lesion of the soft parts covering the left side of the spinal column was deemed probable although tuberculosis of the retro-peritoneal glands could not be excluded. A tentative diagnosis of Pott's disease of the spine was made, and was shortly confirmed by a cold abscess appearing in the left inguinal region.

Case 2.—M. D., M. G. H., was twelve years of age when he was first brought to the out-door department of the hospital on July 18th, 1921, his mother complaining that he had been struck on the back by a base-ball bat. He was examined by one of the associate surgeons in the orthopaedic department who found that there was a scoliosis with a convexity to the right in the lower dorsal region and that the left scapula was elevated and prominent. There was pain on lateral movement, especially to the left and some muscular spasm of the erector spinae group of muscles, especially on the right side. An x-ray examination demonstrated no lesion of any individual vertebra, but a definite scoliosis in the dorsal region.

The patient unfortunately did not return to the clinic until November 30th, 1921, when he was brought to the hospital suffering from pain in the right lower quadrant of the abdomen. He appeared then to be desperately ill. His temperature was 102 and his pulse was much accelerated. There was definite tenderness over the right lower quadrant of the abdomen, and it was considered wise to admit him into the ward of the hospital for observation. Examined by the physician in charge of the ward a tentative diagnosis of miliary tuberculosis was made. He died on the tenth day after his admission into the hospital. An autopsy performed by Dr. Lawrence J. Rhea revealed miliary tubercles scattered profusely through the organs of the body; also two caseous tubercles in the cerebellum, and miliary tubercles and one conglomerate tubercle on the cortical meninges. There were a great many acute tubercles in the lungs and abdominal viscera. There were also tuberculous ulcers in the intestinal walls. These and the caseous tu-

bercles in the cerebellum were older than the miliary tubercles in the other viscera. There was a very definite tuberculous lesion between and including the eleventh and twelfth dorsal vertebrae. This was considered to be the primary lesion. In the soft tissues covering the diseased vertebrae there was a small collection of tuberculous pus, but this had not extended beyond the site of the lesion.

On reading the history above one recognizes that the associate surgeon who examined him realized the probability that the child was suffering from an inflammatory lesion in the spinal column. In our clinics muscular spasm is recognized as the first symptom to appear and the last symptom to disappear in any form of arthritic inflammation. Spasm was demonstrated in this patient; lateral movement also caused definite pain and there was a scoliosis which had to be accounted for; scoliosis with muscular spasm and pain is rarely if ever present except from an organic lesion. The x-ray examination, however, apparently revealed no inflammatory focus in the vertebrae, only a scoliosis.

Is it possible to make a definite diagnosis of Pott's disease on the three symptoms mentioned: (1) Muscular spasm: (2) Pain on movement: (3) Scoliosis. While it may not be possible to make a positive diagnosis on such meagre information I cannot help feeling that these symptoms should be sufficient to make a tentative diagnosis. Muscular spasm, as we have said, is an important symptom of an arthritis. Pain on spinal movement is another symptom which must never be overlooked. Lastly, a scoliosis especially a scoliosis which might be described as of an acute angular variety, is not infrequently due to Pott's disease when the lesion is more of a unilateral than of a bi-lateral or central character.

The importance of making a diagnosis in a case of tuberculosis of the spine is necessarily great. A tuberculous arthritis demands rest, whereas if no arthritis is present and a scoliosis is the only symptom for which the surgeon is consulted exercises and forcible manipulations are often prescribed. The patient whose history has been briefly cited, died of a miliary tuberculosis apparently following Pott's disease. Would it have been possible to have saved this patient from this miliary tuberculosis by early treatment of the disease in the spine? This is uncertain; at the same time it is recognized that the number of cases of miliary tuberculosis which develop as a terminal affection in well treated cases of Pott's disease of the spine are extremely few.

Retrospect

HAEMORRHAGIC DISEASE OF THE NEWBORN*

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Montreal

ALTHOUGH the various manifestations of this disease had been recognized for a long time it was not until 1911 that Schloss and Cumiskey¹ first attempted to separate those hæmorrhages which were purely symptomatic from those essentially spontaneous and due to no demonstrable cause. It is this last condition to which the name of hæmorrhagic disease of the newborn should be limited.

About the same time Lespinasse and Fisher² made the statement that on account of the sudden recovery with no convalescence, neither infection nor change in the capillaries could be considered an adequate explanation. The condition would appear, therefore, to be due to a change in the chemical composition of the blood.

Lucas³ and others working on the physiology of the infant's blood, found that during the first four days of life there is a definite prolongation in the coagulation time. The appearance of hæmorrhage apparently depends on whether this peculiarity is exaggerated or not. During these early days the prothrombin element is also found to be diminished and as this element is derived mainly from the platelets one would expect a corresponding low platelet count. This however is not the case, although there is evidence to show that there are qualitative changes in the platelets. It is now generally accepted that the immediate cause of this disease is a lack of prothrombin or a loss of the prothrombin-antithrombin balance.

Rodda⁴ has devised a simple clinical method for determining the coagulation time in infants. Briefly it consists in collecting one drop of blood in a clean watch glass containing a No. 6 lead shot. The end point of coagulation occurs when the shot is caught up in the fibrin and no longer rolls. This simple practical method only claims to detect gross variations from the normal range. By it Rodda was able to determine that coagula-

tion normally occurs in from five to nine minutes in the newborn infant while in hæmorrhagic disease it may take fifteen minutes or more. Indeed, in several cases of melæna neonatorum it required even ninety minutes.

Duke⁵ described a simple method for testing the bleeding time which is quite independent of the coagulation time. The ear is punctured with a sharp needle and the blood wiped up every minute by blotting-paper. Normally the bleeding ceases in from two to five minutes in the newborn infant but is much prolonged in those showing a hæmorrhagic diathesis.

In an investigation into the causes of death in stillborn and newborn children Warwick⁶ found at autopsy that 50% showed intra-cranial hæmorrhages and in about half of these gross hæmorrhages were present in other organs of the body. Thus by far the more frequent cause of death in the newborn is cerebral hæmorrhage and this may occur quite independent of any trauma or asphyxia.

Rodda⁷, of Minnesota, and Foote⁸, of Washington, D.C., about the same time demonstrated the tendency to hæmorrhage in newborn infants is often first manifested as intra-cranial hæmorrhage. This is associated with delayed coagulation and prolonged bleeding time. They both strongly advise that blood coagulation tests be performed as a routine on all newborn infants, for by this means not only may the child's life be saved but permanent damage to the brain prevented by proper treatment.

Whatever the fundamental cause of this disease may be there is no doubt as to the best method of treatment. Human blood is the specific cure, in fact the only safe and efficient remedy.

Welsh⁹, in 1911, first showed the value of subcutaneous injections of human serum and Schloss¹⁰ the value of whole human blood given in the same way. Both of these methods have been found simple and adequate in mild cases. Usually 20 to 30 c.c. of either serum or whole blood should be given and the dose repeated two or three times.

Horse serum and various preparations of thrombin, while much inferior, may be used with benefit when human blood is not available. Gelatin and calcium salts are worthless.

In severe cases and especially if the infant is

*Presented before the Osler Reporting Society. Montreal, March 24th, 1922.

exsanguinated, transfusion is to be preferred. By this means not only is the defective element supplied to the infant's blood, but some of the blood lost by hæmorrhage is replaced.

It is now generally agreed that when possible agglutination tests should be performed as the serum of a small proportion of newly born infants contains agglutinins for adult corpuscles. Alan Brown and others¹¹ have shown that even the blood of a mother or father is incompatible in nearly 50% of cases. The fact that accidents so rarely happen from hæmolysis is largely due to the fact that iso-agglutinins and their receptors are not completely developed at birth.

The amount of blood it is safe to transfuse at one time is an important consideration. This is based on the blood-volume of the infant, which Lucas and Dearing¹² have shown varies considerably but averages about 15% of the body weight. From this it has been found that from 10 to 15 c.c. per pound of body weight is a safe yet effectual amount, if given slowly.

True hæmorrhagic disease of the newborn is a self-limited disease leading either to death or

recovery in a few days. The use of human blood in the treatment has reduced the mortality from about 60 to 10 or 15 %.

The only sequela of any moment is an intracranial clot which demands early and radical treatment in order to forestall mental impairment, epilepsy or so-called Little's disease.

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A Study of Hypotension.—A consideration of the blood pressure records in 440 cases of absolute hypotension and 145 cases of relative hypotension suggests to Stewart R. Roberts, Atlanta, Ga., that hypotension seems to be equally distributed between the sexes. Hypotension patients have proportionately more normal hearts than have normal persons or hypertension patients. As the pressure rises the heart is more likely to be diseased. The pulse rate is not a determining factor in hypotension. It tends to rise only very slightly with rising pressure. The rate of the pulse is more dependent on the sex than on the blood pressure. Hypotension may accompany different diseases. It is difficult to prove the influence of the disease in the causation of the hypotension because, as a rule, the pressure before disease is unknown. The lowest pressures occur in secondary anemia, pellagra, somasthenia, neuroses, tuberculosis and the acute infections of the respiratory tract. Relative hypotension is a term that should probably be restricted to persons of 45 years and older whose pressure ranges between 111

and 119, both inclusive. The classification of hypotension is important because it separates hypotension in health from hypotension in disease and makes clearer the intricate problems of low blood pressure. Hypotension is not a bar to insurance in the old line companies, although in one series of 3,389 accepted candidates, the death rate was two thirds greater than the expectancy tables would indicate. Women seem to develop hypotension at an earlier age than men, as indicated by two series of cases. The percentage of the hæmoglobin is not a determining factor in hypotension. In disease of the circulation, secondary anemia is the most common accompaniment of hypotension. Arteriosclerosis and myocardial diseases are relatively rare. Focal infections are common accompaniments of hypotension. In sick adult negroes there are more cases of absolute hypotension than of hypertension. Hypotension seems to tend to accompany acute diseases characterized by fever and chronic diseases characterized by diarrhoeas, as amebic dysentery, sprue and pellagra.—*Jour. Amer. Med. Association*, July 22nd, 1922.

Editorial

AURICULAR FIBRILLATION AND QUINIDIN

AURICULAR fibrillation is one of the commonest disturbances of cardiac rhythm. It may be of an acute and transitory character, superimposed on a relatively healthy muscle, but more usually it is associated with the impaired myocardium of rheumatic or arteriosclerotic hearts. In the early stages of fibrillation there may be little if any sign of lost compensation, and any means of restoring a normal rhythm should be of value in the treatment of these cases. While digitalis gives very striking results where chronic passive congestion is present, it has little effect on the auricular rhythm. It produces a partial blockage of the bundle of His, allowing a more regular action of the ventricles, but the auricles continue to fibrillate. In such cases the newly introduced drug quinidin may prove of service. In a certain proportion of cases it actually restores a normal rhythm to the heart as a whole. Lewis has shown that quinidin produces this effect by increasing the refractory period of the heart muscle, and so breaks up the aberrant waves of contraction which are passing through the muscles of the auricles, and allows the normal pacemaker to resume its control of the cardiac rhythm. These findings are confirmed by Cohn and Levy of the Rockefeller Hospital.

In its therapeutic use this result is not obtained in every case, but Oppenheimer in a collection of 462 cases from the literature finds the normal to be restored in 53.7 per cent. of the cases. In many instances the restoration is only of a temporary character, but Hamburger reports that in 27 per cent. of a small series it persisted for three or more months. It must be remembered that quinidin does not attack the cause of the arrhythmia, the tendency to fibrillation still persists, so that any

mild infection or upset will often cause a return of the irregularity and call for further treatment.

With our increasing experience it has become evident that the drug has a definite toxic action. Levy has noted the following untoward effects: Headache, palpitation, gastric upsets, giddiness, diarrhoea, precordial pain and fever; any of which may appear during the exhibition of the drug. It may actually increase the degree of cardiac failure, and in about 20 per cent. of cases it sets up ventricular extrasystoles which call for a discontinuance of the drug. Collapse, embolism, and unexplained sudden death have also been noted, although Oppenheimer and Mann think that these dangers have been unduly stressed. The drug as a rule gives poor results in large hearts with multiple valve lesions, or in cases in which there is marked involvement of the myocardium, but seems useful in the more recent cases where the fibrillation is not due to some acute infection of the heart. It is given most effectively after a preliminary period of rest, after special dietary regulation, and after the heart has been thoroughly digitalized. The daily amount to be administered is from 1.25 to 2.0 gm. (gr. xviii-xxx.) divided into five equal doses, given at two hour intervals. The drug is to be continued until the rhythm has become regular, or until extrasystoles appear when it should be discontinued. It is generally regarded as wise to continue its administration in small doses (eg. 0.3 gm. daily) for some time after the initial course.

The success of any method of treatment should be judged not only by its action on the function of any organ or system but also by its effects on the comfort and efficiency of the individual. Is then

quinidin only a scientific curiosity; a drug which while it chances to restore a normal rhythm to the heart, has little influence on the patient's efficiency? or is it a drug whose use is followed by a definite improvement in the functional capacity of the circulation? Present knowledge would indicate that quinidin helps a certain proportion of fibrillating hearts, lessens palpitation in many, and in a few actually sets up a regular rhythm, but in a majority of seriously embarrassed hearts its action, as yet,

must be regarded as of doubtful value. All observers are in agreement that hospital observation is a necessity for safe treatment, associated with aid from the electrocardiograph when obtainable. At present the action of the drug is too uncertain to warrant its general introduction into private practice. Here digitalis must still continue to be our chief support in broken compensation and in cardiac arrhythmias.

D. S. LEWIS.

INDUSTRIAL MEDICINE

EDGAR L. COLLIS in his retrospect of prehistoric history writes: "Industry may be considered as an outward and visible sign of the progress of human intelligence, and the mile stones along the road—the stone age, the bronze age, the iron age, the machinery age—gather additional interest when considered as stages in the evolution of mind. . . . The statement may be made that the intelligence of a race is measured by its industry, and that the primary *raison d'être* of industry is safety and health. In other words, industry is the means that human intelligence employs to insure the existence of the race."

It is also apparent that one of the important issues of industry is the improvement of living conditions in the life of the race struggling for existence, and during the past two decades particularly, many industrial organizations in different parts of the world have individually developed important activities concerned with the comfort, happiness and health of their employees.

From the days of the knife factory operated by the father of Demosthenes with thirty slave workers to the beginning of the factory system in Italy in the 15th and 16th centuries, the transition in industry was tremendous; as remarkable, however, and of recent date is the appreciation by those who direct

the policies of modern industrial organizations of the value of hygienic conditions in factories, and their recognition of the fact that industrial medicine is a good economical investment. It reduces time lost from illness and other causes of absenteeism, diminishes labour turnover, prevents accidents and generally safeguards the health of the workers; more important still, it advances the spirit of goodwill, loyalty and cooperation which are of essential and fundamental importance to the attainment of the fullest measure of success.

Furthermore, notwithstanding many labour saving devices the human machine is and will long continue to be the most important factor in the production of industrial wealth, and the medical supervision of all the conditions under which work is carried on is demanded in an increasing degree, not only in the interest of the manufacturing organization but also by humanitarian principles and by the laws of the land.

To further the value of such medical supervision courses of instruction in the various departments of industrial medicine have been established in several of the higher medical schools of the United States and in a few European countries, and there is a clear call for our Canadian universities, which have unusual responsibilities as well as opportunities in connection with this

phase of medical knowledge, to undertake courses of special post-graduate training to enable young graduates to qualify for work in this field. It is to our medical faculties that business concerns should be able to turn both for advice and counsel relative to the development of such industrial medical service, and for adequately trained physicians to carry on such work on the most scientific lines. A certain amount of undergraduate instruction merits consideration as a means of stimulating the interest of students wishing to prepare themselves for a career in industrial medicine. University graduate courses should include the subjects of applied physiology, industrial toxicology, indus-

trial operation, nutrition, industrial medical practice, industrial surgery, industrial medicine, vital statistics, and industrial sanitation. The value to the student of actual contact with the hygienic activities demanded in industrial establishments cannot be too strongly emphasized.

We consider it therefore desirable at the present time to emphasize the fact that industrial medicine is assuming a position of fundamental importance in the conservation of the human resources of the nation and offers opportunities to our universities further to contribute to the efficiency and happiness of present and future generations.

B. L. WYATT

CANADIAN OTO-LARYNGOLOGY

LIKE the other specialties "Otolaryngology" is of comparatively recent growth, but possibly chiefly from financial considerations, it is appealing to a rapidly increasing number of our younger graduates, and there is a danger that the high standing which the early methods of securing the necessary training entailed, will be depreciated by the present cheaper routes of travel to the desired goal.

The older specialists all obtained their post-graduate training in Europe—an expensive and prolonged experience—usually of three years duration. In the last quarter of a century, with the development of special clinics on this continent, the position of house surgeon to such a clinic for a year or eighteen months, or attendance upon one of the post-graduate courses in New York for a few weeks or months at the utmost, has provided a tempting short cut, and a large proportion of the younger "specialists" have never seen a foreign clinic, are ignorant of the problems to which their predecessors were presented, do not read the scientific special journals, and content themselves with removing tonsils and adenoids, and opening mastoids. Thus

in Canada and the United States there has arisen a host of oto-laryngologists out of all proportion to the number of general practitioners, and greatly in excess of the relative number which exists in Britain or the continent. With this increase in numbers, the scale of preparation and scientific attainment, as well as the resultant scientific production has not kept pace. The leading societies of oto-laryngologists in America are aware of the danger, and are striving to set a higher ideal before the profession. The leading special hospitals are lengthening the period of residence for their interns; the universities engaging in post-graduate instruction are insisting that those who take special classes shall study to some purpose and for definite periods; thus the course in Minnesota is one of the three years, and the American Medical Association has appointed a representative committee to consider the question of the training of the specialist in all its bearings. In Britain a request has been made of the Conjoint Board to establish a Diploma in Laryngology and Otology obtainable by examination.

In Canada, outside of the University clinics in Montreal and Toronto, few

opportunities exist for the training of the would be specialist. An interesting experiment is under way in the latter institution, where the Rockefeller gift has made it possible to arrange in this department for a graded course of four to five years, one of which must be spent in a laboratory. It would need, however, a number of such courses to provide adequate facilities for the Canadian profession, and until every large hospital in Canada bends its shoulder to the wheel, by establishing internships in this specialty, the Canadian who desires to become fully trained in oto-laryngology must seek foreign instruction.

While the training of the specialist has not been standardized in North America, and the average professional and scientific standing of these practitioners in the United States and Canada is of a lower grade than that of their confreres in Britain and most European countries, our universities in North America have recognized the necessities of their undergraduate students and have adopted a reasonable curriculum with compulsory examination upon the special subject as a part of the final examination, this examination to be conducted by specialists.

In over 50% of the class A colleges, instruction in oto-laryngology finds its separate place in the curriculum of the third and final years; in the rest the course is compressed generally into the final year. Instruction is confined to the

anatomy and normal appearances of the parts concerned, familiarity with the head mirror and the use of the simpler instruments of examination, together with a knowledge of the pathological appearances of the more usual diseased conditions. It is generally recognized that the student has no call while an undergraduate to see operations, make differential diagnoses, etc., but by his ability to recognize the beginnings of evil to learn when to summon "special" aid.

In Canada we have established the principles of full departmental responsibility with education through two years of the course, compulsory attendance, and thorough examination by specialists, who have a reasonable quota of beds and clinics, a position only attained in Britain under the 1922 amended regulations of the Conjoint Board. If under-graduate teaching be limited along the lines laid down, it can never lead to specialization, or be reproached as trespassing on the time required for medicine, surgery and midwifery in an overcrowded curriculum. "What doctors need in their daily practice should be made compulsory." The student should be taught to recognize that an inflamed middle ear or nostril demands diagnosis and treatment to the same extent as a diseased heart or kidney. Thus only can the permanent deafness so common after aural and sinus affections be reduced, and a high mortality rate be avoided. D. J. GIBB WISHART

Editorial Comments

A NEW MEDICAL QUARTERLY

A new quarterly journal entitled *Medicine* has made its appearance under the editorial direction of Dr. David Edsall, of Harvard, and Dr. John Howland, of Johns Hopkins Medical School, published by Messrs. Williams and Wilkins Co., Baltimore. It is intended as the medium of publication of critical reviews dealing with internal medicine, neurology and pediatrics.

These will not be limited as to length and the editors hope to present articles of an authoritative nature covering the progress of medical science in a way not before attempted in any American periodical.

The first number sets a high standard of excellence and consists of two papers: The therapeutic use of digitalis, by G. Canby Robinson, and, The treatment of meningococcus meningitis, by Kenneth Blackfan. The first, which

covers 127 pages, is a very full presentation of the pharmacology and therapeutics of digitalis. There are many references to the literature, but in the place of the usual bald statement of conflicting facts, the author presents an unusually good *critique* of the different findings, after the manner of the excellent critical reviews which appear at intervals in the English scientific journals. One cannot fail to be impressed by the sound judgment of the author, at once progressive and yet conservative. The article on meningitis also bears the stamp of the writer's association with what represents the best in American pediatrics. To many his remarks on intensive treatment will be a further stimulus in the management of the disease. His sturdy optimism in regard to the treatment of meningitis is required in view of the uniform lack of effect of serum treatment during the first years of the war. Active intrathecal serum therapy has a definite effect on the outcome of epidemic meningitis. Further numbers of the journal will be awaited

with interest by an appreciative circle of medical readers

ORGANIZATION

"Organization is the correlation of all the forces and factors available in the establishment of a mechanism capable of producing the best results with a minimum of cost, wastage and friction."

In what way can this definition be applied to the medical profession.

Organization is the massing together of the medical profession intent upon studying the ways and means by which the profession can render the very best possible service to the community, at the same time establishing an *entente cordiale* in the profession which makes for greater harmony and mutual regard, thereby tending to eliminate all petty jealousies and malefactions; while, on the other hand, making it easier for the profession to meet with the public to better advantage and greater profit to both.

T. C. R.

Treatment of Heart Failure.—In the treatment of failure of compensation, Starling says, rest is most important. It not only diminishes the demands on the heart from the arterial side, but by removing the main cause for the return of the blood to the heart it enormously decreases the inflow into this organ; and it is inflow which in the healthy heart determines output. The value of oxygen, when there is any cyanosis, is explained by its action in diminishing the blood pressure necessary to drive a sufficient amount of blood through the brain, the relaxation of arterioles and the improved supply to the vital organs of the body, and the direct effect of a proper supply of oxygen in improving the contraction and aiding the reintegration and recovery from fatigue of the heart muscle. The plethora attending failure of compensation is a reaction on the part of the organism, as a whole, not on the part of the heart, and does not assist this latter organ. It may, in fact, be harmful when the heart is beginning to recover under the influence of the

other modes of treatment just mentioned. One can, therefore, understand the beneficial effects of bleeding as a preliminary measure in certain cases of failure of compensation, as well as the value of diminished salt intake. Another factor of importance in enabling the heart muscle to recover its physiologic condition is the circulation through the coronary vessels. Starling is inclined to ascribe the beneficial effects of graduated exercises in heart disease very largely to the improvement of the coronary circulation brought about by the temporary rise of arterial pressure accompanying the exercises. So important is the coronary circulation for the functional capacity of the heart that every medical man should be aware of the manner in which this circulation is regulated. The oxygen usage of the heart is directly proportioned to the work it does, and its oxygen supply must therefore vary within the same limits as its work, i. e., in a healthy heart from 1 to 7 or 10.—*London Lancet*, Dec. 10th, 1921.

Correspondence

ON THE DEVELOPMENT OF PROFESSIONAL INITIATIVE AND CRITICISM—
A NOTE FROM THE WEST

To the Editor: Considering that Canada is largely an undeveloped country it is not strange that the dominant idea presiding over professional education is that practical men should be produced. Apparently these men have been produced; men at all events who have been able to adapt themselves to their environment, and who have satisfied their patients and clients. A practical attitude, however, is usually one of compromise; certainly it is so in politics, and in medicine it may tend to the acceptance of authoritative statements and formulæ as facts without sufficient individual criticism. Modesty and lack of self assertion have been stated to be faults met with in Canadians. They are characteristics which certainly would not be attributed to a Canadian by his detractors, but in medical science the Canadian profession is so dominated by the energetic activity and momentum of the profession in the United States and by the tradition and achievements of British medicine, that it lacks the arrogance to disagree with the statements made and sanctioned by one or other of these august and intellectual bodies. The attitude of the profession in the past has been one of docility and amenability to being taught. An excellent quality, no doubt, in children and in the ignorant; but in the adult it may imply an undue mental servility and an absence of that critical faculty to which the advancement of science has in the past been due.

Moreover, the rapid development of this country in the past few decades has appeared to many as owing more to the efforts of large organ-

izations, such as railways, and incorporated companies, rather than to those of individuals; the average Canadian intellect as a rule considers that progress and security are dependent on these systems of power and authority and reacts against anything of a revolutionary nature, which might be subversive of stability. In politics he may be reactionary; in science or medicine he may be more critical; but on the whole his attitude is that it is hopeless to expect anything of value from mere individuals, and that all advance should be left to properly equipped laboratories, or organized institutions where thoroughly accredited heads are in command. May not this reliance upon or amenability to the opinion of others be carried too far? Let us, as a Canadian profession, develop a more critical and independent frame of mind. Let us prove all things, and hold fast only that which we find to be true. It is the members of our profession in their recognized associations who should set the pace in matters of public health and interest; of the numerous problems now filling pages of the Press, they should endorse only those which have a scientific or humanitarian aspect after calm and thoughtful discussion. The "Dope Menace" and "Total Prohibition" both demand an expression of opinion from our medical societies. We should neither remain silent or echo the exaggerated statements of well meaning but excited and hysterical persons. The would-be teacher who speaks or writes may be wrong in whole or in part, notwithstanding an appended list of authorities. For the development of this spirit of constructive criticism it would be well if the Journal reserved one or two pages in each issue for short concise letters from its readers.

J. E. C.

Vancouver, August 25th, 1922.

Drug Therapy in Pyelitis.—An attempt was made by Henry F. Helmholz, Rochester, Minn., to determine the direct mode of action of several of the more commonly used drugs in the treatment of pyelitis. The action of the alkalis, of hexamethylenamin and of salol has been studied. In acute cases of pyelitis, the alkalis are useful,

but there is no evidence of any direct specific action. Hexamethylenamin has a very definite bactericidal action in the bladder, but whether this applies also to the pelvis of the kidney has not been demonstrated. Phenyl salicylate does not have antiseptic properties in the doses given. *Jour. Amer. Med. Association*, July 22nd, 1922.

Abstracts from Current Literature

SURGERY and ANÆSTHESIA

The Treatment of Perforated Gastric and Duodenal Ulcers. Southam, A. H. *Brit. M. J.*, April 8th, 1922.

The writer bases his paper on a series of forty-six cases—forty were duodenal or pyloric, five gastric, one gastro-jejunal. Thirty-four patients with duodenal ulcers were operated on within 24 hours after perforation and all recovered, the remainder died from shock. Of the five gastric ulcer cases, two died subsequently from pulmonary complication. The mortality was 8.7%. After treatment, Fowler's position is adopted on return to the bed, rectal salines are given, the stomach is kept at rest as far as possible in order to give an opportunity for the ulcer to heal.

After discharge, a careful diet for six months. Sodium bicarbonate is given to diminish any tendency to hyperacidity, and defective teeth are attended to.

The earlier the operation after diagnosis the better the prognosis.

There are certain types of perforating ulcers commonly found in the duodenum which, when put at rest by infolding and suture combined with careful diet and rest, will heal. Under those conditions it is better to leave the stomach in its natural condition without the complication of a gastro-enterostomy. If the ulcer should subsequently prove to be of the unhealable type, a gastro-enterostomy can be performed later. In a large proportion of the cases a gastro-enterostomy does not appear necessary.

B. F. MACNAUGHTON

Splenectomy in Banti's Disease, Third Stage.

Fisher, David. *Surg. Gyn. Obst.*, August, 1922.

The author briefly discusses the therapy of splenectomy, quoting articles by W. J. Mayo abstracted previously in this Journal. It is apparent that cases operated on in the third stage have not been reported often enough to afford definite conclusions. Where ascites, liver cirrhosis, intense jaundice and enlarged spleen exist the patient is doomed, but an operation offers a fighting chance as proven by occasional cures following splenectomy. In the last twenty years,

Sweetser was able to collect only forty-two cases where this was done in the third stage of Banti's disease, or in diseased conditions of undetermined etiology. The mortality was 26.5% giving the patient three chances out of four. Fifty-five per cent. of those who survived operation, lived and enjoyed good health for more than fifteen months and may be considered to be cured. Spleens removed show hypertrophy of the connective tissue and thickened adherent capsule; the pulp and Malpighian bodies are atrophied, and surrounded by dense fibrous tissue. Splenectomy results in fewer organisms in the bile following operation, stimulates all lymphatic tissue, increases the resistance of the red cells, rendering them less fragile, causes a loss of iron from the body, though less in chronic than in acute conditions. The first case splenectomized for Banti's disease (Cushing) is alive twenty-three years later, though occasionally he has an attack of hæmatemesis. The two cases reported were Banti's disease; one recovered, one died a few hours after the operation. Both cases showed a three or four plus Wassermann which is almost constant in this disease, and exists in many cases of jaundice in spite of intense antisyphilitic treatment.

CHARLES K. P. HENRY

Intra-Cardiac Injections (Les Injections Intracardiaques.) Cheinesse, L. *La Presse Medicale.*, Oct. 22 1922.

L. Cheinesse quotes a paper by J. Winter published in 1905 on the results of experiments made with adrenalin in animals, whose breathing and pulse had stopped during chloroform anæsthesia. He found that the injection of a solution of adrenalin into the left ventricle either directly through the chest wall, or after uncovering the heart, started the heart beat, whilst other measures such as adrenalin given intravenously had no such effect.

Winter suggested that this measure should be employed upon human beings in cases of apparent death under chloroform.

Latzko about the same time reported three cases in which he had made such injections. In one of them, a case of perforative peritonitis, pulse and respiration having stopped, he injected adrenalin into the left ventricle. Cardiac pulsa-

tions began again, the patient was able to speak but death took place in an hour.

Modern physiological research, confirmed by clinical observation, shows that there is a definite space of time between the apparent and the real death of the heart. Intracardiac injection is the most effectual means of starting the heart beat during this interval, but it must be done while the heart is still irritable and before the brain has suffered irreparable damage, a period of at the most ten minutes.

Cheinesse considers intracardiac injections indicated not only in collapse during chloroform anaesthesia, but in asphyxia, in collapse from hæmorrhage, in traumatic shock, electrocution, and in sudden cessation of the heart beat during operations on the heart, in asphyxia neonatorum, in sudden heart failure in disease of the heart or arteries and in infectious diseases.

Schulze is quoted as saying that intracardiac injection is in no way dangerous and causes no bad after effects. He suggests this method as suitable for obtaining a rapid effect from strophanthus and digitalis, where it is impossible to use a vein.

The technique is simple. After sterilizing the skin with iodine a fine needle measuring 10 c.m. in length is introduced into the fourth left intercostal space one or two fingers breadth to the left of the sternum. The needle is pushed in gently with a slight inclination towards the median line. At the same time gentle attempts at aspiration are made with the piston. At a depth of $3\frac{1}{2}$ to $4\frac{1}{2}$ c.m. one ceases to feel the resistance of the tissues and at the same time one can aspirate blood.

Adrenalin seems to be the most suitable drug to inject. Camphor, caffeine, and preparations of digitalis have been used. Of fifteen successful results collected by Vogt, nine were obtained with adrenalin.

W. D. HOWELL

The Indications and the Dangers in the Use of Spinal Anæsthesia in Obstetrics, Gynecology and Abdominal Surgery. Huggins,

R. R. *Am. J. Obstet. and Gyn.*, April, 1922.

The writer points out that a certain number of deaths occur suddenly on the table from all forms of general anaesthesia. The percentage depends on the skill of the anaesthetist and of the surgeon. There are deaths occurring after the patient leaves the operating room with which the anaesthetist has much to do. The stimulating effect of ether

as evidenced by the flushed face, rapid respiration with consequent over ventilation, the quick pulse and sweating, produce a condition of exhaustion. Especially is this the case where the anaesthetic is taken badly and there are also cyanosis, laboured breathing and rigid muscles. Loss of fluid from post-operative vomiting aggravates the condition.

In spinal anaesthesia, on the other hand, the blood pressure falls, respiration is slow and the skin warm and dry. The heart is rested, instead of being overworked. Mental distress can be prevented by the preliminary use of scopolamine and morphine. The abdominal muscles are relaxed and there is no straining. As a result of low blood pressure there is less bleeding and troublesome oozing. The patients are in better condition immediately afterwards and make a quicker recovery.

The writer considers that spinal anaesthesia is especially indicated in severe pelvic infections with dense adhesions, in fibroid tumours where the heart and entire musculature are weakened as a result of toxæmia and hæmorrhage, in chronic gall bladder conditions, in obesity accompanied by fatty degeneration of the heart, in the early stages of acute spreading peritonitis and in pulmonary tuberculosis and asthma. He considers the method dangerous where there are permanent changes in the arterial system which interfere with the normal elasticity of the arteries and in general where the blood pressure is very high or very low. It is also contraindicated in patients desperately sick as in general peritonitis and in severe shock.

Two fatal cases are cited. One was a case of eclampsia where caesarian section was to be performed. A convulsion took place immediately after the introduction of the anaesthetic. Respiration stopped suddenly. He thinks the death was due to the sudden change in the cerebrospinal fluid, the anaesthetic being carried up the spinal canal to the medulla.

Huggins therefore considers that spinal anaesthesia is contraindicated in the presence of convulsions.

The second fatal case was a patient desperately ill with a severe puerperal infection. The blood pressure was only eighty before blood transfusion raised it to ninety. After the injection it fell rapidly and steadily without any response to stimulation.

The writer uses novocaine. He gives 2 c.c. of an 8% or 10% solution which has been trebled

distilled. To this are added 4 m. of absolute alcohol. The solution is made freshly and boiled before introduction.

In some of the cases headache followed and this was found to be due to the use of distilled water which had been contaminated from a defective still.

Two hours before operation a hypodermic injection of scopolamine gr. 1/200 and morphine gr. 1/8 is given. Thirty minutes before another eighth of a grain of morphia is given. The patient's ears are plugged with cotton and he is blindfolded.

W. D. HOWELL

MEDICINE

An Additional Contribution to the Symptomatology of Epidemic Encephalitis. Kennedy, Davis and Hyslop. *Arch. Neurol. and Psych.*, July, 1922.

This article embraces a contribution to the late symptomatology of encephalitis lethargica and enriches our present knowledge of the widespread clinical incidence of this disease.

The cases are grouped under the following headings: 1. spinal types; 2. disturbance of metabolism; 3. disorders of motility and 4. disorders of the vago-sympathetic mechanism.

Under spinal types are noted cases, manifesting, not only affections of the ventral horns and evidence of transverse softening of the cord, but, also, an entire new symptom-complex—that of syringomyelia.

Metabolic disturbance is becoming more evident and cases are cited to illustrate temporary disorders in the vegetative system. Increase of body weight, excessive thirst, polyuria and, occasionally, glycosuria with diminished sugar tolerance were noted.

Under disorders of motility, our attention is drawn to such symptoms as stammering, rhythmic movements, breathing irregularities and eccentric station, as evidence of disturbance in the toning mechanism.

The final vago sympathetic-group—is characterized by first; a strongly positive oculo-cardiac reflex-ocular pressure, in one of these cases, stopped the pulse for twenty-eight seconds, following relief of pressure; and second, by exophthalmos, which was observed in twelve cases.

As a result of their investigation in the drug therapy of epidemic encephalitis, which the

authors believe should be directed toward the vegetative nervous system, the following observations are recorded:

1. Thyroid and pituitary substances have no effect on the residual encephalitic symptoms.

2. Epinephrin increases the pulse rate by 50% and increases the rigidity for several hours after administration.

3. Atropine, in large doses, increases the rigidity and makes the patient subjectively worse.

4. Scopolamin, in doses of 1/100 grain three times daily by mouth produced a lessening of the rigidity in one-half the cases in which it was employed. It restored facial mobility and rendered the patient more comfortable.

5. Gelsemium—the fluid extract—in doses of 7 minims, three times daily, had a very similar effect to that of scopolamin and the effects persisted so long as the drug was used.

The conclusion arrived at is that, in scopolamin and gelsemium, we have our most useful drugs in relieving the rigidity and discomfort associated with the late residual effects of encephalitis. Of these, gelsemium is more advantageous in that it can be used indefinitely and is free from the dangerous effects, of a cumulative nature, sometimes associated with scopolamin.

F. H. MACKAY

The Constitutional Symptoms of Tuberculosis. Krause, A. K. *New York M. J.*, April, 1922.

The author lays stress upon the importance of making a diagnosis in tuberculosis as to the *activity* of the infection. The constitutional symptoms are equally important for prognosis and diagnosis as they result from a poisoning which develops from the absorption of materials from tuberculous foci. This intoxication is probably a non-specific process induced by the absorption of material from the foci in a large enough quantity to produce the symptoms. These materials are from the *cell elements of the tubercle* rather than from the bacilli. The constitutional symptoms referred to are evidenced by fatigue after normal strain, over-irritability, with consequent disturbances of circulation and digestion, fever, with an unusual daily range of temperature, malnutrition and loss of muscular tone. Acute constitutional symptoms imply re-infection.

The author concludes that under conditions of complete physical rest, mild tuberculosis takes care of itself.

C. F. MARTIN

Some Abuses of Cathartics. Baggott, B. H.
J. S. Carolina M. A., April, 1922.

The writer deprecates the indiscriminate use of purgatives, especially at the onset of all diseases, more especially in obscure acute abdominal conditions. Thus, for example, in appendicitis the use of purgatives hinders nature in its efforts to wall off an abscess and may induce peritonitis. Ochsner is quoted as saying that in thirty years of practice, he has never had a diffused peritonitis except where a cathartic was given.

Again, the use of purgatives in purulent diseases of the gallbladder and bile passages is also held to be unwise. The same is true in cases of intestinal obstruction, duodenal ulcer, gastric ulcer and typhoid fever.

He further makes the interesting suggestion that in chronic constipation, the use of cathartics merely results in depressing the neuro-muscular mechanism of the intestine, which should, on the other hand, be improved by means of diet, exercise and general regimen and habits. C. F. MARTIN

The Use of Tuberculin in General Practice.

Baumeister, A. *Müch. Med. Wochenschr.*, April, 1922.

The author advocates tuberculin treatment in all cases of mild tuberculosis, especially those with a subfebrile course. Tuberculin is especially useful in mild forms of glandular, osseous or cutaneous tuberculosis, as well as in those affecting the genito-urinary system and the eye. Wherever the condition is mild and chronic and without sign of progression, the results are held to be excellent. On the other hand, tuberculin should not be used when the process is progressive and exudations are obvious. For such cases as are favourably susceptible to the use of tuberculin, he recommends the additional use of heliotherapy, moderate exercise in the open air, but not necessarily over-feeding or rest.

Tuberculin is justifiable in chronic ulcerative tuberculosis only where the condition seems to be stationary or very slightly progressive towards fibrosis. He recommends the use of Koch's old tuberculin where a strong focal reaction is required. Where, however, a severe reaction should be avoided, he prefers the new tuberculin bacillus emulsion. While it is impossible to establish any definite rule-of-thumb for the use of tuberculin, he deprecates the newer inunction and vaccination methods of Petruschky and Poundorf as being dangerous because there is a

fear of inaccurate dosage and the absorption of too much of the tuberculin.

In using the old tuberculin, the author begins with 0.0000001, and increases progressively to 0.0000003, 0.0000006, 0.000001, giving two or three injections a week and avoiding severe reactions. The interval between the injections depends on the reaction of the dose. Many months are necessary before one can be satisfied as to the beneficial effects of the treatment, and its continuance depends upon the improvement of the patient. C. F. MARTIN

Cure of Early Diabetes Insipidus After Lumbar Puncture. Tucker, J. *Am. J. M. Sc.*, May, 1922.

The writer's experience in one case suggests that the withdrawal of spinal fluid may be of advantage in some cases of early diabetes insipidus inasmuch as, twenty-four hours after the operation, relief of the symptoms was obtained and remained permanent for five and a half months.

The patient's symptoms were increased thirst, polyuria, and sweating; and examination of the nervous system showed involvement of some of the cranial nerves on the left side.

Tucker recorded the condition as one due to a serous meningitis with oedema of the infundibulum cerebri and involvement of the cranial nerves. It would seem that in this case the diabetes was associated with an obstruction of the flow of the normal secretion due to transient oedema of the pituitary gland, or to some extrapituitary condition which caused increased intracranial pressure, and perhaps some exudate outside of the pituitary body. C. F. MARTIN

Sudden Death and the Endocrine Glands.

Olbrycht, J. *Polska gaz. lek.*, March, 1922.

It is not an infrequent experience to find clinically unexplained sudden deaths where the autopsy reveals some lesion of the endocrine glands, most often, perhaps, of the adrenals. Sometimes, indeed, no explanation is found. The occurrence of sudden death in the status thymicolymphaticus is well recognized, and many cases have been described. One usually finds at autopsy in these cases abundance of subcutaneous fat, pale skin and general enlargement of the adenoid system. It has been thought that in some way hyperactivity of the thymus has been the cause of death, but the conclusive evidence is still wanting.

Among the various changes in the endocrine system which were found in the autopsies on these cases were the following:

Malformation of the suprarenal gland, especially its medullary substance, with decrease in the chromaffin cells, and atrophy; degeneration of the thyroid gland, alteration in the development of its epithelial secreting structure, etc. It is recognized that an antagonism exists between the thymus and the chromaffin system, the thymus having an inhibitory effect upon the sympathetic nervous system, while the chromaffin system has a stimulating action. Sudden death, it is presumed, occurs as the result of hyperthymization from insufficiency of the chromaffin system. This explanation is but a part of the pathogenesis.

Death from disease of the adrenals is not only more common but more easily explained. If the medullary substance is destroyed, death takes place. A proof of this has been frequently observed in death following severe hæmorrhages in the adrenal occurring in the course of various infectious diseases. The significance of the other endocrine glands is as yet unexplained, but it would seem that the extensive destruction of any of the vital glands of the endocrine system may explain sudden death where no other etiological factor is apparent.

C. F. MARTIN

The Practical Significance of the Alimentary Hyperglycemia Curve. Rosenberg, Max. *Klin. Wochenschr.*, Berlin, February, 1922.

It is now well recognized that glycosuria does not necessarily result from an excess of sugar in the blood, and that even with normal kidneys, the glycosuria is independent of the amount of blood sugar.

In normal individuals the author found that the experimental blood sugar rose to twice the normal without sugar appearing in the urine, and that only after excessive amounts of grape sugar had been taken was there any glycosuria.

On the other hand, he introduced dextrose by rectum, avoiding the liver, and found that glycosuria appeared on slight hyperglycæmia. The important point was that by introducing the dextrose through the rectum, the liver was avoided showing that when sugar passes through the liver, it becomes of a certain nature characteristic for the organism. Evidence of this fact is adduced from a case of illuminating gas poisoning, in which the blood sugar was twice the normal while there was no glycosuria, but after injecting

a certain amount of grape sugar, there was glycosuria with an even lower hyperglycæmia.

Testing for alimentary hyperglycæmia is, therefore, of great use in diagnosis, especially in elderly people, when latent diabetes may be present, when, as happens in such cases, the kidneys do not react to the stimulus of the increased blood sugar, and, therefore, no glycosuria is shown. In other words, alimentary hyperglycæmia testing may show changes of the carbohydrate metabolism, which cannot be found by any other means.

C. F. MARTIN

The Use of Sulphur in the Treatment of Chronic Deforming Joint Diseases.

Meyer-Bisch, R. *Berlin Klin. Wochenschr.*, March, 1922.

The use of sulphur is compared with that of proteins. It is a non-specific reaction of the normal and diseased organism to the injection of proteins and chemically-active bodies.

Apparently the injection of sulphur induces a decrease of chondroitin sulphate in cartilage and catabolism of specific cartilage substances. It is for this reason that the sulphur has been recommended. Injections of sulphur induce leukocytosis, which may be used as a standard of dosage. Leukocytosis occurs even after 3 c. c. of a 1-1000 solution. The general symptoms are no greater than those after injections of milk. 1 gm. of sulphur in 100 gm. of olive oil may be used as a strong solution, while 1/10 of that solution may be used as a minimum dose. It is well to begin with weak solutions, not more than 5 c.c. of a 1-1000 solution injected into the musculature of the buttocks. If no reaction occurs, a stronger solution may be used after one week's interval. If after two days there is evidence of an improvement in the joints, one may use passive movements to assist the cure. Two further weekly injections of 5 c.c. of the weak solution will probably suffice in mild cases, and if the case be more severe, an additional injection may be given, and the treatment may be repeated after an interval of several months. Cases are reported in which manifest improvement has occurred.

C. F. MARTIN

The Recognition and Treatment of Minor Degrees of Fibrositis. Marlin, T. *Brit. M. J.*, April, 1922.

The writer believes that very many cases of obscure muscular pain, stiffness and signs of

resistance in the soft tissues of the body are due to definite fibrous thickening. With care, these thickenings may easily be palpated. Many conditions of illness are, he believes, associated with this pathological change. He enumerates many other symptoms arising in this way; headaches, associated with indurations in the upper fibres of the trapezius; flatulent dyspepsia, associated with fibrous strands in the erector spinæ muscles. Cases of this kind are readily treated successfully by means of massage and manipulation.

The writer's statements are of interest in view of the importance of proper medical guidance in the use of massage, which would so often obviate the necessity of patients consulting the irregular practitioners and finding relief at their hands.

C. F. MARTIN

The Cranial Hyperostoses Produced by Meningeal Endotheliomas. Cushing, Harvey. *Arch. Neur. and Psych.*, August, 1922.

In a series of over one thousand presumptive cases of brain tumour, the lesion was verified in 748 instances. The endotheliomas represented 10.7 per cent. of these cases and occurred in the ratio of one to four of the gliomas.

Of the eighty endotheliomas, twenty were accompanied by a recognizable thickening of the overlying bone. For reasons not as yet entirely clear, endotheliomas *en plaque* are more likely to provoke bony thickening from tumour invasion than are the large rounded tumours. The hyperostosis, which is either palpable externally or demonstrable by the roentgen ray, is due to invasion of the bony canals by tumour cells, with resultant stimulation of osteoblasts and the production of new bone.

G. S. MUNDIE

Spinal Drainage Following Intravenous Arsphenamine. Craig, C. B., and Chaney, L. B. *J. Nerv. and Ment. Dis.*, August, 1922.

Of twenty-five cases of syphilis of the nervous system treated with intravenous arsphenamine followed by spinal drainage, of which only tabetic and parietic cases are cited, the writers come to the following conclusions:

1. No single method of treatment is applicable to all cases.
2. The intravenous administration of arsphenamine is the method of choice.
3. Spinal drainage after intravenous administration of arsphenamine is not a hazardous procedure.
4. Drainage will benefit some cases

which have arrived at a position of inertia under intravenous administration alone. 5. As satisfactory clinical and serological results may be obtained by intravenous arsphenamine and drainage as are produced by the intraspinal method and without the severe root-pains frequently set up by the latter method.

G. S. MUNDIE

Xanthochromia Due to Acute, Purulent Spinal Meningitis. Horrax, Gilbert. *Arch. Neurol. and Psych.*, July, 1922.

This is the report of a case of purulent spinal meningitis, manifesting a xanthochromatic fluid which differs from the classical xanthochromia of Froin, in the absence of spontaneous clotting.

The typical xanthochromatic fluid of Froin is characterized by its yellow colour, spontaneous clotting, high globulin content, variable pleocytosis and absence of positive tests for hæmoglobin.

It is a compression syndrome, determined by the isolation of a cul-de-sac in which the fluid stagnates and is generally considered a result of tumour or gumma of the cord.

The case cited by the writer, in which full clinical and autopsy findings are given, presents a further causative factor in the production of this syndrome, namely, purulent meningitis, though, as is suggested by the writer, the probability of the formation of a cul-de-sac with similar effect, is borne out by the extensive exudate formation about the cord and the absence of any discoverable organisms in the fluid.

F. H. MACKAY

Some Conditions Controlling Internal Secretions. Cannon, W. B. *J. A. M. A.*, July, 1922.

In this article the author presents a concise summary of the known physiological facts bearing upon the interrelation of the internal secretory glands and their position in the physiological activity of the organism. While admitting the obvious influence that the internal secretions have upon bodily function, such as growth, proper development, sex character and metabolic activity, he clearly points out that they are not the central generators in such activity but that they, too, are dependent upon physiological control in the healthy normal organism. In the government of the personality and of metabolic activity, he does not hold that the seats of the

mighty are occupied, solely, by the endocrine glands but, rather, that they play a secondary role—controlling and being controlled—in the maintenance of normal physiological activity.

Evidence, both physiological and experimental is presented to show the influence of the vegetative nervous system upon the endocrine system. Three glands, at least, the suprarenal medulla, the liver and the thyroid have been shown to respond in increased secretory output, to stimulation of the splanchnic nerve while, coincidentally, these same organs are known to respond in like manner to such influences as pain, asphyxia and emotional excitement, acting, as has been shown through the medium of the splanchnic nerve.

The effect of rage, fear and anxiety, in producing an increased output of epinephrin, hyperglycemia and glycosuria and the effect of stimulation of the cervical sympathetic in increased thyroid activity are clearly shown.

Evidence that the posterior lobe of the pituitary is also influenced by nervous impulses is probable but less authentic while there is little authority for placing the pancreas (islet-cells) in this category. That the suprarenal or thyroid can continue to function after their control nerve is severed is no proof that they are independent of nervous control any more than that the heart which continues to beat after the vagus is severed is an independent organ.

Some interesting conclusions are drawn on the theory of vagotonia which has come to be accepted in medical literature as a real condition. Eppinger and Hess, the authors of this theory, conclude that the entire vegetative nervous system is under the control of the internal secretions but Dr. Cannon not only relegates this conclusion to the realm of theory but clearly points out the impossibility of its acceptance. He shows that the anatomical distribution of the two great divisions of the vegetative nervous system *viz*: the sympathetic and autonomic are essentially different. The sympathetic system is arranged for diffuse and wide-spread activity and is amenable to stimulation by a chemical agent such as epinephrin and, indeed, is brought into activity as a whole by such stimulation as is evidenced in the simultaneous dilatation of the pupil, rapid heart action, vasodilatation and hypo-motility of the stomach and intestines.

On the other hand the autonomic system is arranged anatomically to act in independent parts. A contracted pupil, effected through stimulation by light, of the cranial autonomic, is not neces-

sarily accompanied by slowing of the heart or hyper-motility of the intestine as there is no conceivable need of the organism that could call for such a combination.

The sympathetic is diffuse and general and, as such lends itself to the influence of epinephrin. The autonomic is independent as to its several parts, both in anatomical distribution and function and cannot be influenced as a whole, by any chemical agent while, in fact, no such agent has ever been found except in the imagination. Hence, while the term—sympatheticotonia—is permissible in the light of present known facts, the opposing state—vagotonia—is an unknown quantity and without any foundation of fact.

The second part deals with the other endocrine organs, the testis and suprarenal cortex which are known to be devoid of nerves, and evidence is produced to show that the activities of these organs are influenced by agents reaching them through the blood stream—the humoral control.

In dealing with the evidence bearing upon the inter-relation of the various ductless glands, he states "all is a maze of complex possibilities, contradictory reports and uncertain inferences."

While it is known that growth may be influenced by several glands, namely, the anterior lobe of the pituitary, the thyroid and the gonads: that reproduction depends not alone upon the gonads, but also upon the suprarenal cortex, the thyroid and the pituitary: that carbohydrate metabolism is controlled by the pancreas, liver, thyroid and pituitary, yet, it is not at all clear what these inter-relations are or how one organ may affect the other.

The only conclusion that present authoritative evidence can support, is that there is an inter-relation and inter-dependence between the various glands of the system and that, as a group, the ductless glands are not self-sufficient but govern and are governed in common with all other bodily tissues that go to make up the complete physiological unit.

F. H. MACKAY

Suture of Severed Median Nerve With Rapid Recovery of Function. Wirth, Edgar. *Brit. M. J.*, 2:900, November 26th, 1921.

This is the record of a case of rapid recovery of the median nerve following suture. The nerve was accidentally severed in the arm and at the time of operation the following findings were made:

1. Complete loss of voluntary movement in all the muscles supplied by the nerve.

2. Complete sensory loss to all forms of sensation in the entire median distribution.

End to end approximation was done and the nerve sutured with chromicized catgut. The brachial artery was ligated at the same time.

Two days later, evidence of recovery was noted in better flexion at the wrist joint and some degree of abduction of the thumb.

Six weeks later, voluntary power had returned in all the muscles of supply and sensory loss was much less extensive.

Five months after the operation, the only weakness, noticable in voluntary power, was in flexion of the distal phalanx of the thumb and index finger. Sensory loss now involved only the index finger. No electrical reactions were recorded.

F. H. MACKAY

The Intradermal Reaction in Experimental Tuberculosis.

—Debré and Bonnet (*C. R. Soc. Biologie*, March 4th, 1922) bring forward evidence to suggest that the local reaction of the guinea-pig to an intradermal injection of tuberculin—the animal having previously been infected with living tubercle bacilli—varies more or less directly with the resistance of the animal. They find that a dose of 0.5 mg. of living tubercle bacilli determines the death of a guinea-pig weighing 400 to 500 grams in five to seven weeks, that of one of 500 to 600 grams in ten to fourteen weeks, and that of one of 700 to 800 grams in sixteen to seventeen weeks. Also the local reaction and the swelling of the lymphatic glands draining the site of injection are more pronounced in the heavier than in the lighter animals. Further, in the heavier animals the health remains good till just shortly before death, while in the lighter ones there is a progressive loss of weight almost from the start. At autopsy the former animals are found to have a local lesion in process of cure, marked regional lymphatic swelling, large tubercles in the liver and spleen, and a confluent bronchopneumonia; in the latter group, however, the local and lymphatic lesions are minimal, while a generalized tuberculosis is manifest throughout the body. Now, if intradermal reactions be made on infected guinea-pigs of varying weights, it is found that the intensity of this reaction is directly proportional to the intensity of the local reaction following the injection of the bacilli, and that the persistence of the intradermal reaction is longer in proportion as the weight of the animal is heavier. These results are in close accord with what is found in human infants. In weakly, poorly nourished infants the evolution of tuberculosis is accompanied by a progressive loss of weight and a

practical failure to respond to the tuberculin reaction, while in healthy, breast-fed infants fever persists to the end and the tuberculin reaction is very marked.—*Brit. Med. Jour.*, June 3rd, 1922.

The Demand for Vitamins.

—In spite of the fact that ordinary fresh foods are the simplest, cheapest and richest sources of vitamins, the public apparently demands to be supplied with vitamins in the form of medicinal products.

The public "demands" vitamins in pill form! Why? For the same reason that the public, lay or medical, demands many things today that it does not need—because the whole trend of modern advertising is toward creating demands, rather than supplying needs. Vitamin concentrates are being "demanded" by the public because shrewd and forward-looking "patent medicine" exploiters are using all the subtle arts of modern advertising to convince the public that it is in serious danger of vitamin starvation, and that the only hope lies in buying these alleged concentrates to make up a hypothetical deficiency. It seems inconceivable that a rational man would pay a tremendously high price for certain food factors which are already present in his ordinary diet. But he will; and advertising is the reason. Advertising campaigns such as these of the vitamins constitute a vicious circle; an artificial demand is created and then the manufacturer excuses his business on the ground that he is merely supplying a demand! As our British contemporary says, "ordinary fresh foods are the simplest, cheapest and richest sources of vitamins."—*Jour. A.M.A.*, March 18th, 1922.

News Items

ONTARIO

Meetings of many County Societies in Ontario took place during July, the notes of which were unfortunately received too late for publication last month. During August the following Societies held interesting meetings at all of which a good attendance was reported.

The Haldimand County Medical Society met at Dunnville on August 10th, and was addressed by Dr. R. G. Armour of Toronto, his subject being "The Diagnosis of Lesions of the Spinal Cord."

At the meeting of the Northumberland and Durham Medical Societies at Brighton on August 23rd, Dr. R. D. Rudolf of Toronto, spoke on "System in the Care of the Sick."

On August 24th, the Lambton County Medical Society met at Sarnia. The interpretation of signs and symptoms of chronic gastro-intestinal disease was discussed before the Society, by Dr. F. W. Rolph of Toronto.

The Directors of the O.M.A. announce that, owing to the munificent grant of the Ontario Division of the Canadian Red Cross Society, and the healthy financial condition of the Association, it has been decided to provide each affiliated Society in the Association with eight lecturers free of cost during the coming year.

The Committee on Education of the Ontario Medical Association will shortly issue a new Post Graduate Schedule covering the extension lectures to be offered by the Association. Owing to the co-operation shown by the medical faculties of the Universities of the province and the profession at large, the schedule will be a very complete and comprehensive one. Copies, when ready, will be mailed to the members of the Association.

The Essex County Medical Society has appointed an efficient Committee to conduct the 43rd annual meeting of the Ontario Medical Association, which is to be held in Windsor on May 29th, 30th, 31st, and June 1st, 1923; Chairman, Dr. E. R. Secord, Brantford; Vice-Chairman, Dr. P. A. Dewar, Windsor; Secretary, Dr. T. C. Routley, Toronto; Vice-Secretary, Dr. R. E. Holmes, Windsor. Committee on Arrangements: Chairman, Dr. R. D. Morand, Windsor; Doctors Frank Adams, Brockschire, Lanspeary, Moody and Wiley. Committee on Entertainment: Chairman, Dr. Casgrain, Windsor; Doctors Cruickshank, Fred Adams, Little, Laing, St. Pierre, Bucke and Robson.

District Number Four of the O. M. A. held an interesting session at the Clifton Hotel, Niagara Falls, on August 29th, which included a comprehensive afternoon programme, a dinner, and round table addresses. The programme in the afternoon was as follows: "Common Skin Affections," by W. R. Jaffrey of Hamilton; "A Study of the Symptoms of Hypo-Tension," by W. K. Colbeck of Welland; "Psycho-Analysis," by G. S. Glasco of Hamilton; "Some Phases of the Goitre Problem," by J. K. McGregor of Hamilton; "Notes on Fractures," by F. W. E. Wilson of Niagara Falls; "Venereal Disease," by R. R. McClenahan of Toronto, illustrated by slides provided by the Government of Ontario. Addresses after dinner were made by Dr. E. R. Secord, the president of the Ontario Medical Association, and by Dr. T. C. Routley, its secretary. Dr. J. W. F. McCullough of the

Provincial Board of Health, spoke on "Health Conditions in England;" and Dr. B. F. Schreiner of the New York State Institute for the study of malignant disease, in Buffalo, described the method of treatment of uterine cancer as employed in their institute.

District No. 3 of the Ontario Medical Association, comprising the counties of Bruce, Grey and Dufferin, presided over by Dr. T. H. Middlebro of Owen Sound, held its annual meeting in Owen Sound on Friday, September 15th, when the following programme was presented: "Rheumatic Fever and Endocarditis," Dr. Duncan Graham, Toronto; "Bone Infections," Dr. C. L. Starr, Toronto; "Diagnosis and Treatment of Goitre," Dr. Geo. S. Young, Toronto. After a banquet, served in the hall of the Y.M.C.A., addresses were delivered by Dr. E. R. Secord, President, and Dr. T. C. Routley, Secretary of the O.M.A. An attendance of close upon sixty manifested the keen interest evinced by the practitioners of the District.

The Sault Ste. Marie Medical Society held an afternoon and evening session on Tuesday, September 5th, when addresses were delivered by Doctors Duncan Graham, C. L. Starr, E. A. Morgan, E. R. Secord, and T. C. Routley, who were on their way to attend the District meeting at Port Arthur and Fort William. A keen discussion followed each paper, and it was evident that the programme was much appreciated.

The same lecturers presented papers before District No. 10 of the Ontario Medical Association, comprising Kenora, Patricia, Rainy River and Thunder Bay, at Port Arthur and Fort William on September 7th and 8th. Hospital clinics occupied the morning and papers were read at the afternoon, and evening meetings; ample opportunity was given for thorough discussion of the various topics presented. The attendance was excellent, and the meetings altogether successful.

The Peel County Medical Society held five meetings in August, all in Brampton. The programme presented at the first meeting contained the names of Dr. Fletcher McPhedran, who spoke on the "Diagnosis and Treatment of Pneumonia;" of Dr. J. H. McConnell, who spoke on "Extra Uterine Pregnancy;" and Dr. E. B. Hardy, who spoke on "Cystoscopy." At the second meeting held on August 10th, Dr. D. K. Smith of Toronto, spoke on the "Diagnosis and Treatment of Common Skin Affections;" Dr. Harvey Clare of Toronto, on "Mental Disease;" and Dr. J. E. Mullin of Hamilton, spoke upon the work of the Ontario Medical Association, and upon the question of "Medical Politics." At the third meeting of this Society on August 17th, Dr. F. W. Marlow of Toronto, described the pathology, clinical signs and treatment of Uterine Hemorrhage; Dr. H. M. Tovell of Toronto, spoke upon the "X-Ray Findings in Pulmonary Tuberculosis;" and showed slides illustrative of the various conditions. Dr. Stewart Cameron of Peterboro, addressed the meeting on "Uterine Carcinomata." At the fourth meeting Dr. C. H. Gilmour of Toronto, addressed the meeting on "Inflammatory Diseases of the Pelvic organs;" and Dr. R. W. Mann spoke of the "Aid to the Practitioner that a Laboratory Might be Expected to Contribute;" Dr. George W. Ross gave an address on the "Pathological Gall-bladder." At the fifth meeting on August 30th, Dr. A. B. LeMesurier of Toronto, spoke on "Fractures of the Femur;" Dr. George S. Young on "Psycho-Therapy from the Standpoint of the General Practitioner;" Dr. Stewart Wright gave his personal experiences in the "Investigation of Chronic Arthritis;" and Dr. R. I. Harris described "Some of the Abdominal Emergencies of Childhood."

NEWS ITEMS TO APPEAR IN THE FOLLOWING ISSUE, AND TO BE OF VALUE MUST BE RECEIVED BY THE EDITOR BEFORE THE 15TH OF THE MONTH.

BRITISH COLUMBIA

DR. R. WIGHTMAN, of Vancouver, has resigned from his position of School Medical Officer.

THE British Columbia Medical Association held its annual meeting at the University of British Columbia, in Vancouver, on August 21st and 24th. There was a large attendance at the two evening sessions, and included many members from the interior and from Vancouver Island. Among the latter was Dr. L. G. Milne, of Victoria, the oldest practising physician in the province. After a relatively quiescent period during the period of the war, the Association was again put on an active basis a year ago with a membership of 295. This year the membership has increased to 375, and comprises the majority of physicians and surgeons practising in the province. To Mr. C. J. Fletcher, of Vancouver, the Executive Secretary, this rapid increase in membership is in a large measure due.

During the year the Educational Committee of the Association carried out a public health campaign in the larger centres and the hearty response with which this effort was received justifies the hope of further activities along similar lines in the future.

Much routine business was transacted during the sessions of the past year including the adoption of a new Constitution and By-Laws.

The following officers were elected for the ensuing year: President, Dr. Eden Walker, New Westminster; Vice-President, Dr. W. O. Rose, Nelson; President-Elect, Dr. Geo. Hall, Victoria; Immediate Past President, Dr. A. S. Munro, Vancouver; Secretary-Treasurer, Dr. W. A. Clarke, Vancouver; Executive, Drs. F. W. Andrews, W. P. Patterson, M. W. Thomas and H. E. Tremayne.

The annual Summer School of the Vancouver Medical Association was held as usual in August. Lectures, clinics, laboratory demonstrations and operative clinics occupied the entire week of August 21st to the 26th. The number registering was 175, almost as many as last year despite the counter attractions across the line. Many excellent clinics, bedside and operative, were provided by members of the Association; Dr. A. T. Bazin, of Montreal, and Dr. W. D. Connell, of Kingston, each gave four lectures. Dr. Bazin chose as his subjects, cholecystitis, empyema, breast tumours and hernia. Dr. Connell spoke on the anemias, arterio-sclerosis, spastic paraplegia and the arrhythmias of the heart. Lantern slides were freely used and the pathological specimens and plates which Dr. Bazin sent from the museum of McGill University were models in preparation and appearance. A dinner was given under the auspices of the British Columbia Medical Association, providing an enjoyable opportunity to relax from the serious strain of the previous days.

Obituary

Dr. Samuel D. Cameron, formerly of Arthur, Ont., died suddenly at Yakima, Washington Territory, on August 18th.

Dr. James Clark Manning, formerly of Ontario died in San Antonio, Texas, on August 23rd, in his eighty-first year.

Dr. J. G. Hanley, a graduate of Queen's, 1902, died in Kingston on August 29th, aged 44 years. Dr. Hanley had practiced in New York, but at the outbreak of the war went for service with the Imperial Army, and did excellent work in Egypt, Mesopotamia, Gallipoli and France.

Dr. Alexander Hamilton, a remarkably fine type of the "doctor of the old school," died in Toronto on July 30th, aged 78 years. A man of many interests, educated in Canada, England, France, Germany and the United States, he was versatile to a degree. A student of the old Toronto School of Medicine; he saw Osler enter as an undergraduate, and leave following some misunderstanding with the authorities, and from him the writer was able at one time to acquire many details of Osler's early life in Toronto. Born in Onondaga, Dr. Hamilton acquired his early education in this village, entering later the faculty of arts of Toronto University. In 1858 he took the silver medal in mathematics. From the University he went into teaching, thence to medicine. After graduating he spent several years in England and Vienna paying particular attention to the then developing work in microscopy; some months were spent in France and a few more in New York, under Austin Flint. For many years he practiced in Port Hope, but in 1884 moved to

Toronto where he kept up an active interest in the practice of his profession until a few years ago. In addition to his keen activities in "spelling reform", Dr. Hamilton showed a decided literary bent and for long was a keen student of both the French and German languages.

N. B. G.

Dr. Angus Wylie Kenning, died in Victoria B.C. on August 21st. Born in Elmira, Ontario, in 1868, and educated in the public schools, he started for the West at an early age and joined the Hudson Bay Company in Winnipeg, where many of the old timers will remember "Angus" as one of the lacrosse stars of the old 90th championship teams. In the early nineties he began the study of medicine and graduated from the Detroit School of Medicine in 1895. For a short time he practised in Duluth, Minnesota, but he missed the frontier life of the West, and in 1896 came to British Columbia, and located in Rossland, then the centre of great excitement in gold mining. Here he practised for several years and became Rossland's leading surgeon and one of its most prominent citizens. In 1911 he moved to Victoria where he soon acquired a large practice. Dr. Kenning was an acute diagnostician and careful operator and possessed an unusual degree of sound clinical judgment. He was most active in promoting the interests of the profession. He became surgeon to St. Joseph's Hospital, where he was chairman of the Staff at the time of his death, and surgeon and gynaecologist to the Jubilee Hospital. He was also elected to the presidency of the Victoria Medical Association. He is survived by his wife and two sons, Drs. Gordon C. and Stuart G. Kenning, who were associated with their father in practice.

Dr. Kenning was a man of strong character, broad culture and charming personality, and of the highest integrity of purpose and action, and his memory will long be remembered by his many friends.

NEWS ITEMS TO APPEAR IN THE FOLLOWING ISSUE, AND TO BE OF VALUE MUST BE RECEIVED BY THE EDITOR BEFORE THE 15TH OF THE MONTH.

Dr. Octavius Weld of Vancouver, B.C., passed away after a short illness in the Vancouver General Hospital, on September 11th, at the age of sixty years. His death was due to pneumonia, but his health had been unsatisfactory for some months. He was a graduate in Arts in 1883, and in Medicine in 1886, of Toronto University. In 1889 he received the license of the Royal College of Physicians, and membership in the Royal College of Surgeons. He was a charter member and a trustee of the Vancouver Medical Association and its second president; one of the original founders of the British Columbia Medical Association, a member of the Canadian Medical Association, and consulting surgeon to the Vancouver General Hospital.

To few of us will it be given at the close of our life's work to invoke among the members of the profession, who have lived and worked with us and who know us, so genuine and personal a sense of loss as in the death of

this kindly Christian gentleman. Coming to Vancouver twenty-eight years ago, when this city was in its infancy, he has practised here ever since quietly and with simple dignity, upholding at all times the best traditions of a great profession. Associated with the earliest history of the profession in this province he gave himself unsparingly to its service in hospital and in Association work. In the midst of a busy practice no man was more untiring in his attendance; when any important issue was to the fore his voice and influence always could be depended upon on the side that made for righteousness of thought and action. Octavius Weld was interested in everything that stood for what is best in our national life. The outstanding quality of his character was his simple, rugged honesty, which resulted in an "habitual integrity of life". In his passing the profession has suffered a loss which it can ill afford. His wife and children have the deepest sympathy of every member of the profession.

Lumbago and Sciatica.—Aievoli (*Rif. Med.*, May 22nd, 1922), in a review of the above conditions, refers to a series of 1,578 cases recorded by Lindstedt. One group could be correlated into various articular or spinal deformities, inducing a disturbance of the dorso-lumbar muscular mechanics. Some cases seem due to excessive muscular exertion. Others may be due to

changes in the nervous supply of the muscles. Sciatica is not a constant clinical entity but rather a symptom complex not precisely delimitable. Many cases of sciatica are associated with definite lesions of the neighbouring organs, and might be looked on as a neuralgia from irradiation, or reflex, comparable to trigeminal neuralgia. —*Brit. Med. Jour.*, Aug. 12th, 1922.

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Book Reviews

Essays and Lectures on Clinical Surgery. By A. MacKenzie Forbes, M.D., C.M., Faculty of Medicine, McGill University, Montreal. Reprinted from a series of articles which have appeared in the "American Physician". Published by The Taylors, Philadelphia, 1922.

THIS is a very useful book of convenient size for the pocket, beautifully bound in leather with flexible covers, and well printed. Its contents covering 160 pages consist of a series of thirty clinical lectures on subjects of much interest to the practitioner; all of them extremely practical in character. In all diagnosis and treatment occupy the greater part of the lecture, and are treated in great detail. Among the many subjects discussed the more important are the following: Sacro-iliac strain, obstetrical paralysis, pyopericardium, intussusception, spina bifida, scoliosis, club foot, inguinal hernia in infancy and childhood, tuberculous peritonitis and acute osteomyelitis. The majority of the lectures are on orthopaedic subjects, but a few deal with affections which fall more into the domain of general surgery. The book is a very readable one. Every page is full of useful information. To the student, and to the general practitioner it can be strongly recommended.

A. D. B.

Submucous Resection on the Nasal Septum. By William Neddaugh Dunning, M.D., New York. Surgery Publishing Co., New York.

This is a small book of less than one hundred pages, dealing with the operation for deviated septum. It gives the author's personal experience, and is very freely illustrated. While there is nothing new in this book, it is a very interesting and full description of an operation now very commonly performed.

P. G. G.

A Practical Treatise on Diseases of the Skin. For the use of Students and Practitioners. By Oliver S. Ormsby, M.D. Second edition, thoroughly revised; illustrated with 445 engravings and 4 plates in colors and monochrome. Lea & Febiger, Philadelphia and New York, 1921.

This is an excellent work and can be highly recommended to all practitioners. The classification of the diseases is simple yet very complete. The outline of treatment is practical and many most useful suggestions are given. The author must be congratulated on his excellent book.

D. K. S.

Classics of Scientific Method. The discovery of the circulation of the blood. By Charles Singer, M.D., D.Litt., F.R.C.P., Lecturer in the History of Medicine, London University (University College). Edited by E. R. Thomas, M.A., M.Sc. Price 1s. 6d. net. G. Bell & Sons, Ltd., London, 1922. 75 pp.

A compact treasure of this sort should be in the pocket of every medical man or medical student and it should be among the books prescribed or advised in every curriculum for students of medicine. Dr. Singer whose excellent taste in matters historical has already become known to many Canadians by his contribution to the Osler Memorial volumes, has put before us a wonderful resumé of the most fascinating period in the history of medicine. Not only is it a resumé, but by the skilful arrangement of connecting links the long period between Galen and Harvey is shown as a continuous story. The evolution from Galen through Leonardo da Vinci and Vesalius is concisely and accurately reviewed; the influence of art and anatomy upon physiology is well shown, and surely no one can afford to disregard the information that Leonardo, an artist rather than a physician was one of the first to point out Galen's errors.

The interesting side-chain of Servetus and his conception of the pulmonary circulation is enlightening to a degree. A casual student has long been unable to comprehend how theology's foot was placed on medicine's doorstep and will be ever grateful to the author for the careful explanation. Dr. Singer's sketch of Vesalius, Realdus Columbus, Fallopius, Fabricius of Aquapendente as an apostolic succession of teachers and students in anatomy in Padua producing the final great announcement by Harvey, is a detail deserving of all attention. The influence of the inheritance of a tradition in the work of an institution is nowhere better shown than in Dr. Singer's chapter on Harvey's immediate predecessors in Padua's school.

The history of Harvey's discovery and the epitome and estimate of his work are clearly and attractively given in chapters especially devoted to these questions. Interesting details in the realization of the finer points of the circulation made possible by Galileo and his microscopes are ascribed to Malpighi, Swammerdam, and Leeuwenhoek. There are many reproductions, all of a more excellent type than one expects to see in a small volume of this sort; an excellent index completes the work. It is not too much to say that in this little volume the story of the human circulation may be found well told, and in a manner which should appeal to both the precisian and the artist.

N. B. G.

Mouth Hygiene. A Text-book for Dental Hygienists. Compiled and edited by Alfred C. Jones, D.D.S., Bridgeport, Conn. Second edition, thoroughly revised, with 218 illustrations. Lea & Febiger, Philadelphia and New York, 1921.

This book is written essentially for those interested in the subject of dental hygiene, and will be found very useful not only for those engaged in public health work in relationship to dentistry, but also by the dental student and the general medical practitioner. The book is profusely illustrated and written in simple plain language, which makes it easy and pleasant reading.

P. G. G.

A Test for Diphtheria Immunity and Susceptibility.—A method of testing the blood for the presence of diphtheria antitoxin has been devised by W. H. Kellogg, Berkeley, Calif., said to be quantitatively accurate, and in this respect superior to the Shick test; also, it has the further

advantage that it is applied at a central laboratory on blood which can be sent long distances by mail. In this new test, advantage is taken of the fact that the skin of the guinea-pig is sensitive to the minutest amount of diphtheria toxin.—*Jour. Amer. Med. Assoc.*, June 10th, 1922.

